#### CROPS AND CONSUMPTIVE USE

Consumptive use, often called evapotranspiration, is the amount of water used by the vegetative growth in transpiration and building of plant tissue and that evaporated from adjacent soil or intercepted precipitation on the plant foliage.

The stage of a crop's growth has a considerable influence on its consumptive use rate. Annual crops have three distinct stages of growth. These are: (1) emergence and development of complete vegetative cover during which time consumptive use rate increases rapidly from a low value and approaches its maximum; (2) the period of maximum vegetative cover during which time the consumptive use rate may be near or at its maximum if abundant soil moisture is available; and (3) crop maturation where the consumptive use rate begins to decrease. During the latter period, the plant becomes the limiting factor in the transpiration rate.

Consumptive use values were determined using a modified Penman equation and crop growth coefficient curves. Input data for the modified Penman equation are temperature, humidity, wind, bright sunshine hours, latitude, and mean sea level elevation.

Details on this method can be found in the Food and Agriculture Organization of the United Nations Irrigation and Drainage Paper 24, "Guidelines for Predicting Crop Water Requirements."

The state is divided into four areas called irrigation climatic areas. for the purpose of calculating consumptive use. The areas are shown on Figure 3.1.

## Effective rainfalls were determined by the following procedure:

- 1. Statistical analyses were made of rainfall for each of the months April through October plus the total growing season.
- 2. Effective rainfall for the individual month was based on the analysis for that month and was related to monthly consumptive use and the net irrigation application to arrive at effective rainfall for the month. The value for a normal year represents a 50 percent chance of recurrence and the value for a dry year represents an 80 percent chance of recurrence. Details on the method for relating rainfall to monthly consumptive use and the net irrigation application can be found in Soil Conservation Service Technical Release No. 21, "Irrigation Water Requirements."
- 3. The same procedure as outlined in Step 2 was repeated for the seasonal values of rainfall to determine seasonal effective rainfall.

Because there is greater variability in monthly rainfall amounts than there is in seasonal rainfall amounts, the seasonal effective rainfall is greater than the sum of the individual monthly effective rainfalls.

Net irrigation requirements are shown in Tables 3.1 and 3.2 and are adjusted for the effect of effective rainfall expected during a normal year (50 percent chance) and a dry year (80 percent chance). Carryover soil moisture is moisture available in the soil usually above the 50 percent available water holding capacity at the beginning of the growing season. This carryover soil moisture is used to delay and reduce the net irrigation.

There is a greater chance for rain to fall on a soil at a time when it is capable of holding water if the available water holding capacity is high and irrigation frequency is long. This situation occurs when applying near the maximum allowable net application. Hence, when the net application of irrigation water is large, a larger percentage of the total rainfall will be effective. For net irrigation applications other than 3 inches or  $1\frac{1}{2}$  inches, the effective rainfall shown on Table 3.2 must be multiplied by the correction factor given below:

Net Depth of	<del></del>						· · · · · · · · · · · · · · · · · · ·	<u> </u>
Application	.75	1.0	1.5	2.0	2.5	3.0	4.0	5.0
Factor	.72	.77	.86	.93	.97	1.00	1.02	1.04

When the amount of effective rainfall is reduced because of using less than a 3-inch net depth of application, the net amount of irrigation water required must be increased accordingly. Likewise, if the net depth of application is more than 3 inches, the net amount of irrigation water required may be decreased by the same amount.

To determine the amount of irrigation water that should be applied each month, it is necessary to consider the following:

- 1. The amount of water necessary to fill the root zone to field capacity.
- 2. The amount to be added to each month's needs because of losses in application. This will vary with soils, the irrigation system and field efficiencies.
- 3. The amount applied near the end of the use season may be increased an amount equal to the stored moisture which has been depleted to provide for a greater chance of leaching before the next growing season.
- 4. The time of water application will precede the use period by a period depending on the amount of available water the root zone of the crop will hold.

The net water to be replaced during a normal irrigation is usually the water above the 50 percent level of available moisture holding capacity for the irrigation root depth. This can be determined by referring to Table 3.4 to find the irrigation depth of the particular crop and Chapter 2 for the available water holding capacity. The AWC is

multiplied by the percent depletion, usually not more than 50 percent, to find the net amount of water to be replaced at a normal irrigation. Additional water must be added to compensate for evaporation losses, uneven distribution, and interception by foliage.

### Example:

Given: Soil - Banks (Irrigation Group VIIIA)
Crop - corn, in later part of July

From Table 3.4, Page 3-25, the depth to irrigate corn at maximum root growth is 4.0 feet.

From Page 2-42, the available water capacity of Banks to a 4.0 foot depth is 4.5 inches.

The net water to be replaced would be between the 50 percent and the 90 percent available levels, leaving some water available to the crops during the irrigation period and some capacity after irrigation to accommodate a rain. The  $90\% - 50\% = 40\% \times 4.5$  inches = 1.8 inches net irrigation application. Using a center pivot system, Table 5.11, Page 5-27, shows a 75 percent efficiency. Thus, a gross irrigation application would be 1.8 inches  $\div$  .75 = 2.4 inches.

The irrigation frequency in the southeastern part of the state or Climatic Area II under design conditions is the net irrigation application divided by the design period daily use, as found in Table 3.3, Page 3-23 (1.8  $\div$  0.30 = 6.0 days).

To find the estimated seasonal and monthly crop use, since the application rate is not 3.0 inches or 1.5 inches as calculated in Tables 3.1 and 3.2, use Table 3.2, Page 3-15, and adjust by a factor of 0.90 for 1.8 inch application as shown in the middle of Page 3-2.

Crop: Corn, May 16 - September 23
Net application - 1.8 inches
Carryover soil moisture - 2.25 inches

Month	Consumptive Use	Effective Rainfall Normal Year	Adjusted Rainfall	Adjusted Net Irrigation
May June July August September Season	1.75 5.01 8.21 7.27 2.96 25.20	0.81 2.52 2.33 2.03 1.02 9.53	0.73 2.27 2.10 1.83 0.92 8.58	1.51 6.11 5.44 2.04 15.10

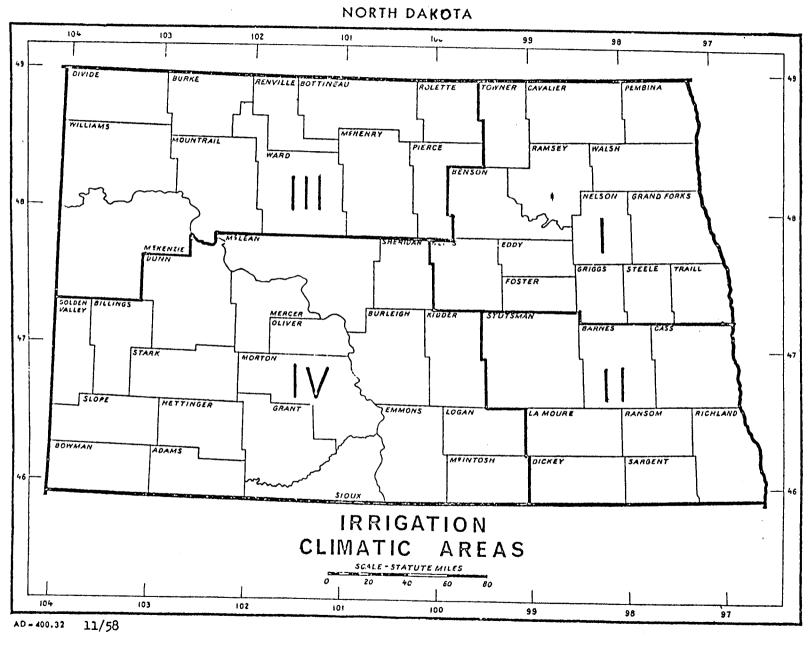


Figure 3.1

Climatic Area I
Carryover Soil Moisture 2.0" - Net Irrigation Application 1.5"

	Consumptive Use	Effective (Inche	es)	Net Irri (Inche	
Month	(Inches)	Normal Year	Dry Year	Normal Year	Dry Year
Crop:	Alfalfa	Averag	e Growing Sea	ason: 5/1 - 10/8	3
April					
May	4.59	1.38	0,77	1.21	1.82
June 1	5.95	2.09	1.38	3,86	4.57
July	7.34	1.88	1.08	5.46	6.26
August	6.41	1,27	0,77	5.14	5.64
September	3.53	0.73	0.30	2.80	3.23
October	0.56	0,20	0.07	0.36	
Season	28.38	8.50	6.61	17,88	0,49 19.77
Crop: Co			e Growing Sea	son: 5/21 - 9/	<b>'</b> 20
April					
May	1.07	0.41	0,20	0.00	0.00
June	4.48	1.94	1.31	1.20	2.04
July	8.12	1.95	1.12	6.17	7.00
August	7.11	1.43	0.82	5.68	6.29
September:	2.43	0.48	0,20	1.95	2,23
October		6.85	5 20	71.20	25.40
Season	23.21	0.0)	5.38	14.36	15.83
	ngar Beets		<del></del>	son: 5/20 - 10/	
April	0 (7	0.20			
May June	0.61	0.38	0.19 1.20	0.00	0,00
July	3.08	1.81		0.00	0.30
August	8.36 7.81	1.96	1.12 0.82	5.90	7.24
September:		1.38 0.76	0.33	6.43	6.99
October	4.37	0.76		3,61	4.04
Season	24.23	7.13	5.48	15.10	16.75
Deason	24.27		7.40	17.10	10.77
	nall Grain	Average	e Growing Sea	son: 5/1 <b>-</b> 8/8	
April				~~	
May	3.12	1.31	0.70	0.00	0,42
	~	2.28	1.52	4.95	5.90
June	7.42				
July	7.26	1.85	1.08	5.41	6.18
July August		1.85	1.08 0.15	5.41 0.59	6.18 0.70
July August September	7.26	1.85			
July August	7.26 0.81	1.85 0.26	0.15	0.59	0.70

RON-CONJUMPTIVE USE = ET

Sheet 2 of 8

# TABLE 3.1

Climatic Area I
Carryover Soil Moisture 2.0" - Net Irrigation Application 1.5"

	Consumptive Use	Effective (Inche		Net Irr (Inch	
Month	(Inches)	Normal Year	Dry Year	Normal Year	
Crop: Po	· · · · · · · · · · · · · · · · · · ·	·		son: 6/4 - 9/1	
April		T		· · · · · · · · · · · · · · · · · · ·	
May					
June	3.69	1.65	1.08	0.0%	
July	7.42	1.89	1.09	5,53	0.61
August	7.25	1.36	0.83	5,89	6.33
September	2.09	0.34	0.16	1,75	6.42
October	2.07	0.24	U.±0		1.93 
Season	20.45	5.81	4.57	12.64	13.88
Jeason ,	20.47	7.01	4.71	12.04	13.00
Crop: Fie	eld Beans	Averag	e Growing Sea	son: 6/4 - 9/1	5
April					
May					
June	2.75	1.55	1.02	0.00	0.00
July	5.86	1.72	0.97	3.34	4.62
lugust !	6.69	1.30	0.77	5.39	5.92
September	2.17	0.34	0.14	1.83	2.03
October					
Season	17.46	5.49	4.22	9.97	11.24
Crop: Gi	rass			son: 5/1 - 9/30	•
May	3.24	1.29	0,70	0,00	
June	5.69	2.10	1.38	3.54	0.54 4.31
July	7.19	1.87	1.08	5.32	
lugust	6.12	1.26	0.77	4.86	<u>6.11</u> 5.35
September:	2.78	0.69	0.29	2,09	2.49
October				2,07	<u></u>
Season	25.02	8.11	6.31	14.91	16.71
Crop:			e Growing Seas		
pril	-				
,					
nay					
	11	1			
lune					
June July					
June July August					
June July August September					
May June July August September October Season					

Climatic Area II

Carryover Soil Moisture 2.0" - Net Irrigation Application 1.5"

¥.	Consumptive Use	Effective (Inche	15		rigation hes)	
Month	(Inches)	Normal Year Dry Year		Normal Year Dry Year		
					<del></del>	
Crop: Al	falfa	Averag	ge Growing Sea	son: 4/15 - 1	0/15	
April	1.71	0.54	0.28	0.00	0.00	
May	5.20	1.65	1.05	2.72	3.58	
June	6.42	2.36	1.33	4.06	5.09	
July	7.49	1.92	1.18	5.57	6.31	
August	6.49	1.67	1.03	4.82	5.46	
September	3.77	1.19	0.56	2.58	3.21	
October	1.09	0.33	0.09	0.76	1.00	
Season	32.17	10.22	8.19	19.95	21.98	
Crop: Co	rn	Averag	ge Growing Seas	son: 5/16 - 9	/23	
April					<del> </del>	
May	1.75	0.70	0.44	0.00	0.00	
June	5.01	2.17	1.25	1.89	3.07	
July	8.21	2.00	1.23	6.21	6.98	
Anguet #	77 277 11	1.75	1.10	5.52	6.17	
	7.27					
September:	2.96	0.88	0.36	2.08	2.60	
September: October	2.96	0.88	0.36			
August September: October Season	2.96	0.88	0.36		2.60	
September: October Season Crop: Su	2.96	0.88  8.20 Averag	0.36  6.57 ge Growing Seas	17.00	16.63	
September: October Season Crop: Su	2.96  25.20 gar Beets	0.88  8.20 Averag	0.36  6.57 ge Growing Seas	17.00 son: 5/15 - 1	16.63 10/1	
September: October Season Crop: Su April May	2.96  25.20	0.88  8.20 Averag	0.36  6.57 ge Growing Seas  0.41	17.00 son: 5/15 - 1	16.63 10/1  0.00	
September October Season Crop: Superil May June	2.96  25.20 gar Beets  0.97 3.95	0.88  8.20 Averag	0.36  6.57 ge Growing Seas  0.41 1.16	17.00 son: 5/15 - 1  0.00 0.21	16.63 10/1  0.00 1.35	
September: October Season Crop: Supering May June July	2.96  25.20 gar Beets  0.97 3.95 8.77	0.88  8.20 Averag  0.69 2.02 2.05	0.36  6.57 ge Growing Seas  0.41 1.16 1.25	17.00  50n: 5/15 - 1  0.00  0.21  6.72	16.63 10/1  0.00 1.35 7.52	
September: October Season Crop: Su April May June July August	2.96  25.20 gar Beets  0.97 3.95 8.77 7.91	0.88  8.20 Average  0.69 2.02 2.05 1.81	0.36  6.57 ge Growing Seas  0.41 1.16 1.25 1.14	17.00  50n: 5/15 -  0.00  0.21  6.72  6.10	16.63 10/1  0.00 1.35 7.52 6.77	
September: October Season Crop: Supering May June July August September:	2.96  25.20 gar Beets  0.97 3.95 8.77	0.88  8.20 Average  0.69 2.02 2.05 1.81 1.24	0.36  6.57 ge Growing Seas  0.41 1.16 1.25 1.14 0.59	17.00  5/15  0.00  0.21  6.72  6.10  3.36	16.63 10/1  0.00 1.35 7.52	
September: October Season Crop: Su April May June July August September: October	2.96  25.20 gar Beets  0.97 3.95 8.77 7.91 4.60	0.88  8.20 Average  0.69 2.02 2.05 1.81 1.24	0.36  6.57 ge Growing Seas  0.41 1.16 1.25 1.14 0.59	17.00  5/15 -  0.00  0.21  6.72  6.10  3.36	16.63 10/1  0.00 1.35 7.52 6.77 4.01	
September: October Season Crop: Su	2.96  25.20 gar Beets  0.97 3.95 8.77 7.91	0.88  8.20 Average  0.69 2.02 2.05 1.81 1.24	0.36  6.57 ge Growing Seas  0.41 1.16 1.25 1.14 0.59	17.00  5/15  0.00  0.21  6.72  6.10  3.36	16.63 10/1  0.00 1.35 7.52 6.77	
September: October Season Crop: Su April May June July August September: October	2.96  25.20 gar Beets  0.97 3.95 8.77 7.91 4.60  26.20	0.88  8.20 Average  0.69 2.02 2.05 1.81 1.24  8.37	0.36  6.57 ge Growing Seas  0.41 1.16 1.25 1.14 0.59	17.00  5/15 -  0.00  0.21  6.72  6.10  3.36   15.83	16.63 10/1  0.00 1.35 7.52 6.77 4.01  17.44	
September October Season Crop: Sur April May June July August September October Season Crop: Small	2.96  25.20 gar Beets  0.97 3.95 8.77 7.91 4.60  26.20	0.88  8.20 Average  0.69 2.02 2.05 1.81 1.24  8.37	0.36  6.57 ge Growing Seas  0.41 1.16 1.25 1.14 0.59  6.76	17.00  50n: 5/15 -  0.00 0.21 6.72 6.10 3.36 - 15.83  50n: 4/15 -	16.63 10/1  0.00 1.35 7.52 6.77 4.01  17.44 7/24	
September: October Season  Crop: Supart Supa	2.96  25.20 gar Beets  0.97 3.95 8.77 7.91 4.60  26.20 all Grain	0.88  8.20 Average  0.69 2.02 2.05 1.81 1.24  8.37 Average	0.36  6.57 ge Growing Seas  0.41 1.16 1.25 1.14 0.59  6.76 ge Growing Seas	17.00  50n: 5/15 -  0.00 0.21 6.72 6.10 3.36 15.83  50n: 4/15 -	16.63 10/1  0.00 1.35 7.52 6.77 4.01  17.44	
September: October Season  Crop: Sugarding May June July August September: October Season  Crop: Small April May	2.96  25.20 gar Beets  0.97 3.95 8.77 7.91 4.60  26.20 all Grain	0.88  8.20 Average  0.69 2.02 2.05 1.81 1.24  8.37 Average	0.36  6.57 ge Growing Seas  0.41 1.16 1.25 1.14 0.59  6.76 ge Growing Seas 0.30	17.00  50n: 5/15 -  0.00 0.21 6.72 6.10 3.36 - 15.83  50n: 4/15 -	16.63 10/1  0.00 1.35 7.52 6.77 4.01  17.44 7/24	
September: October Season  Crop: Supart Supart Supart Supart September: October Season  Crop: Small May June	2.96  25.20 gar Beets  0.97 3.95 8.77 7.91 4.60  26.20 all Grain 2.86 5.59 7.86	0.88  8.20 Average  0.69 2.02 2.05 1.81 1.24  8.37 Average 0.59 1.69 2.53	0.36  6.57 ge Growing Seas  0.41 1.16 1.25 1.14 0.59  6.76 ge Growing Seas 0.30 1.06 1.48	17.00  50n: 5/15 -  0.00 0.21 6.72 6.10 3.36 - 15.83  50n: 4/15 -  0.27 3.90 5.33	16.63 10/1  0.00 1.35 7.52 6.77 4.01  17.44 7/24	
September: October Season  Crop: Superior Superi	2.96  25.20 gar Beets  0.97 3.95 8.77 7.91 4.60  26.20 all Grain 2.86 5.59	0.88  8.20 Average  0.69 2.02 2.05 1.81 1.24  8.37 Average 0.59 1.69	0.36  6.57 ge Growing Seas  0.41 1.16 1.25 1.14 0.59  6.76 ge Growing Seas 0.30 1.06	17.00  50n: 5/15  0.00 0.21 6.72 6.10 3.36 15.83  50n: 4/15  0.27 3.90	16.63  10/1  0.00 1.35 7.52 6.77 4.01 17.44  7/24  0.56 4.53 6.38	
September: October Season  Crop: Superior Superi	2.96  25.20 gar Beets  0.97 3.95 8.77 7.91 4.60  26.20 all Grain 2.86 5.59 7.86 3.89	0.88  8.20 Average  0.69 2.02 2.05 1.81 1.24  8.37 Average 0.59 1.69 2.53 1.24	0.36  6.57 ge Growing Seas  0.41 1.16 1.25 1.14 0.59  6.76 ge Growing Seas 0.30 1.06 1.48 0.74	17.00  50n: 5/15 -  0.00 0.21 6.72 6.10 3.36 15.83  50n: 4/15 -  0.27 3.90 5.33 2.65	16.63 10/1 0.00 1.35 7.52 6.77 4.01 17.44 7/24  0.56 4.53 6.38 3.15	
September: October Season  Crop: Superior Superi	2.96  25.20 gar Beets  0.97 3.95 8.77 7.91 4.60  26.20 all Grain 2.86 5.59 7.86 3.89	0.88  8.20 Average  0.69 2.02 2.05 1.81 1.24  8.37 Average 0.59 1.69 2.53 1.24 	0.36  6.57 ge Growing Seas  0.41 1.16 1.25 1.14 0.59  6.76 ge Growing Seas 0.30 1.06 1.48 0.74	17.00  50n: 5/15 -  0.00 0.21 6.72 6.10 3.36 - 15.83  50n: 4/15 -  0.27 3.90 5.33 2.65	16.63  10/1  0.00 1.35 7.52 6.77 4.01 17.44  7/24  0.56 4.53 6.38 3.15	

TABLE 3.1
ESTIMATED SEASONAL AND MONTHLY CONSUMPTIVE USE

Climatic Area II

Carryover Soil Moisture 2.0" - Net Irrigation Application 1.5"

	Consumptive Use	Effective (Inch	Rainfall es)		rigation hes)
Month	(Inches)	Normal Year		Normal Yea	
Crop: P	otatoes	Avera	ge Growing Sea	ason: 5/30 -	9/1
April					
May	0.12	0,05	0,03	0,00	0.00
June			1.22 1.25	0.74	1,66
July	4.79 8.21	2,12 2.00	1.25	6.21	6.96
August	6.70	1.69	1.05	5.01	5.65
September					
October					
Season i	19.82	6.35	5.17	11.47	12.65
April	eld Beans	Avera	ge Growing Sea	5/30 - 9	/15 
May	0.09	0.05	0.03	0.00	0.00
June	3.38	1,96	1.14	0.00	0.30
July	6.30	1.81	1.11	3.95	5.19
August	6,77	1,69	1.05	5.08	5.72
43UE UU U 11					
	2.27	0.57	0.26	1.70	2 01
September	2.27	0.57	0.26	1.70	2.01
	2.27				2,01
September: October Season	2.27	6.52		10.30	11.50
September: October Season Crop: Gr	2.27  18.82 ass	6.52 Avera	5.32 ge Growing Sea	10.30 son: 4/15 - 1	0.00
September October Season Crop: Gr	2.27  18.82 ass	6.52 Avera	5.32 ge Growing Sea	10.30 son: 4/15 - 10	11.50
September: October Season Crop: Gr April May June July	2.27  18.82 ass 1.28 4.17 6.13 7.32	 6.52 Average 0.56 1.54 2.30 1.90	5.32 ge Growing Sea 0.27 0.91 1.32 1.17	10.30 son: 4/15 - 10 0.00 1.35 3.83 5.42	0.00 2.27
September October Season Crop: Gr April May June July August	2.27  18.82 ass 1.28 4.17 6.13 7.32 6.27	0.56 1.54 2.30 1.90 1.66	5.32 ge Growing Sea 0.27 0.91 1.32 1.17 1.02	10.30 son: 4/15 - 10 0.00 1.35 3.83 5.42 4.61	0.00 2.27 4.81 6.15 5.25
September October Season Crop: Gr April May June July August September	2.27  18.82 ass 1.28 4.17 6.13 7.32 6.27 3.39	 6.52 Average 0.56 1.54 2.30 1.90 1.66 1.16	5.32 ge Growing Sea 0.27 0.91 1.32 1.17 1.02 0.56	10.30 son: 4/15 - 10 0.00 1.35 3.83 5.42 4.61 2.23	0.00 2.27 4.81 6.15
September October Season Crop: Gr April May June July August September October	2.27  18.82 ass 1.28 4.17 6.13 7.32 6.27	0.56 1.54 2.30 1.90 1.66	5.32 ge Growing Sea 0.27 0.91 1.32 1.17 1.02	10.30 son: 4/15 - 10 0.00 1.35 3.83 5.42 4.61	0.00 2.27 4.81 6.15 5.25
September October Season Crop: Gr April May June July August September	2.27  18.82 ass 1.28 4.17 6.13 7.32 6.27 3.39	 6.52 Average 0.56 1.54 2.30 1.90 1.66 1.16	5.32 ge Growing Sea 0.27 0.91 1.32 1.17 1.02 0.56	10.30 son: 4/15 - 10 0.00 1.35 3.83 5.42 4.61 2.23	0.00 2,27 4.81 6.15 5.25 2.83
September: October Season  Crop: Gr  April May June July August September: October Season  Crop:	2.27  18.82 ass 1.28 4.17 6.13 7.32 6.27 3.39 0.87	 6.52 Average 0.56 1.54 2.30 1.90 1.66 1.16 0.28 10.01	5.32  ge Growing Sea  0.27  0.91  1.32  1.17  1.02  0.56  0.09	10.30  son: 4/15 - 10  0.00  1.35  3.83  5.42  4.61  2.23  0.59  17.43	0.00 2.27 4.81 6.15 5.25 2.83 0.78
September October Season  Crop: Gr  April May June July August September October Season  Crop: April	2.27  18.82 ass 1.28 4.17 6.13 7.32 6.27 3.39 0.87	 6.52 Average 0.56 1.54 2.30 1.90 1.66 1.16 0.28 10.01	5.32  ge Growing Sea  0.27  0.91  1.32  1.17  1.02  0.56  0.09  8.02	10.30  son: 4/15 - 10  0.00  1.35  3.83  5.42  4.61  2.23  0.59  17.43	0.00 2.27 4.81 6.15 5.25 2.83 0.78
September October Season  Crop: Gr  April May June July August September October Season  Crop: April May	2.27  18.82 ass 1.28 4.17 6.13 7.32 6.27 3.39 0.87	 6.52 Average 0.56 1.54 2.30 1.90 1.66 1.16 0.28 10.01	5.32  ge Growing Sea  0.27  0.91  1.32  1.17  1.02  0.56  0.09  8.02	10.30  son: 4/15 - 10  0.00  1.35  3.83  5.42  4.61  2.23  0.59  17.43	0.00 2.27 4.81 6.15 5.25 2.83 0.78
September October Season  Crop: Gr  April May June July August September October Season  Crop: April May June	2.27  18.82 ass 1.28 4.17 6.13 7.32 6.27 3.39 0.87	 6.52 Average 0.56 1.54 2.30 1.90 1.66 1.16 0.28 10.01	5.32  ge Growing Sea  0.27  0.91  1.32  1.17  1.02  0.56  0.09  8.02	10.30  son: 4/15 - 10  0.00  1.35  3.83  5.42  4.61  2.23  0.59  17.43	0.00 2.27 4.81 6.15 5.25 2.83 0.78
September: October Season  Crop: Gr  April May June July August September: October Season  Crop: April May June July April May June July	2.27  18.82 ass 1.28 4.17 6.13 7.32 6.27 3.39 0.87	 6.52 Average 0.56 1.54 2.30 1.90 1.66 1.16 0.28 10.01	5.32  ge Growing Sea  0.27  0.91  1.32  1.17  1.02  0.56  0.09  8.02	10.30  son: 4/15 - 10  0.00  1.35  3.83  5.42  4.61  2.23  0.59  17.43	0.00 2.27 4.81 6.15 5.25 2.83 0.78
September October Season  Crop: Gr  April May June July August September October Season  Crop:  April May June July August April May June July August	2.27  18.82 ass 1.28 4.17 6.13 7.32 6.27 3.39 0.87	 6.52 Average 0.56 1.54 2.30 1.90 1.66 1.16 0.28 10.01	5.32  ge Growing Sea  0.27  0.91  1.32  1.17  1.02  0.56  0.09  8.02	10.30  son: 4/15 - 10  0.00  1.35  3.83  5.42  4.61  2.23  0.59  17.43	0.00 2.27 4.81 6.15 5.25 2.83 0.78
September October Season  Crop: Gr  April May June July August September October Season  Crop:  April May June July August September Season  Crop:	2.27  18.82 ass 1.28 4.17 6.13 7.32 6.27 3.39 0.87	 6.52 Average 0.56 1.54 2.30 1.90 1.66 1.16 0.28 10.01	5.32  ge Growing Sea  0.27  0.91  1.32  1.17  1.02  0.56  0.09  8.02	10.30  son: 4/15 - 10  0.00  1.35  3.83  5.42  4.61  2.23  0.59  17.43	0.00 2.27 4.81 6.15 5.25 2.83 0.78
September October Season  Crop: Gr  April May June July August September October Season  Crop:  April May June July August April May June July August	2.27  18.82 ass 1.28 4.17 6.13 7.32 6.27 3.39 0.87	 6.52 Average 0.56 1.54 2.30 1.90 1.66 1.16 0.28 10.01	5.32  ge Growing Sea  0.27  0.91  1.32  1.17  1.02  0.56  0.09  8.02	10.30  son: 4/15 - 10  0.00  1.35  3.83  5.42  4.61  2.23  0.59  17.43	0.00 2.27 4.81 6.15 5.25 2.83 0.78

Climatic Area III

Carryover Soil Moisture 2.0" - Net Irrigation Application 1.5"

Consumptive Use		Effective (Inche		Net Irr (Inch	
Month	(Inches)	Normal Year	Dry Year	Normal Year	Dry Year
Crop: A	lfalfa	Averag	ge Growing Sea	son: 5/1 - 10	/8
April					
May	4.84	1.09	0,49	1.75	2.35
June	6,27	1.89	1.10	4.38	5.17
July	7.76	1.55	0.88	6.21	6.88
August	6.77	1.43	0.59	5.34	6.18
September	3.79	0.69	0.28	3.10	3.51
October	0.62	0.10	0.09	0.52	0,53
Season	30.05	7.47	5.85	20 <b>.</b> 58	22.20
April	7 /5	0.26	0.15		
May	1.45 4.94	0.36	0.15 1.00	0.00	0,00
June				2.30	2,51
July	8.66	1.63	0.90 0.65	7.03 5.86	7.76
August	7.37				6.72
September:	2.09	0.34	0.14	1.75	1.95
October   Season	24.50	6.04	<u></u> 4.71	16.46	17.79
		_			
	gar Beets		e Growing Sea		D/1 
April					
April	0.63	0.30	0.15	0.00	0.00
April   May   June	0.63 3.24	0.30	0.15 0.93	0.00	0.00
April   May   June   July	0.63 3.24 8.83	0.30 1.60 1.63	0.15 0.93 0.95	0.00 0.00 7.17	0.00 0.79 7.88
April   May   June   July   August   May   May	0.63 3.24 8.83 8.26	0.30 1.60 1.63 1,59	0.15 0.93 0.95 0.68	0.00 0.00 7.17 6.67	0.00 0.79 7.88 7.58
April May June July August September	0.63 3.24 8.83 8.26 4.69	0.30 1.60 1.63 1.59 0.72	0.15 0.93 0.95	0.00 0.00 7.17 6.67 3.97	0.00 0.79 7.88 7.58 4.39
April May June July August September	0.63 3.24 8.83 8.26 4.69	0.30 1.60 1.63 1.59 0.72	0.15 0.93 0.95 0.68 0.30	0.00 0.00 7.17 6.67 3.97	0.00 0.79 7.88 7.58 4.39
April May June July August September October Season Crop: Si	0.63 3.24 8.83 8.26 4.69	0.30 1.60 1.63 1,59 0.72  6,42	0.15 0.93 0.95 0.68	0.00 0.00 7.17 6.67 3.97  17,23	0.00 0.79 7.88 7.58 4.39
April May June July August September October Season Crop: Sa	0.63 3.24 8.83 8.26 4.69	0.30 1.60 1.63 1.59 0.72  6,42 Averag	0.15 0.93 0.95 0.68 0.30  5.02 e Growing Sea	0.00 0.00 7.17 6.67 3.97  17.23 son: 5/1 - 8/8	0.00 0.79 7.88 7.58 4.39  18.63
April May June July August September: October Season Crop: St	0.63 3.24 8.83 8.26 4.69  25.65	0.30 1.60 1.63 1.59 0.72  6,42 Averag	0.15 0.93 0.95 0.68 0.30  5.02 e Growing Sea	0.00 0.00 7.17 6.67 3.97  17.23 son: 5/1 - 8/8	7.88 7.58 4.39  18.63
April May June July August September: October Season Crop: Si	 0.63 3.24 8.83 8.26 4.69  25.65 mall Grain  3.29 7.83	0.30 1.60 1.63 1.59 0.72  6.42 Averag	0.15 0.93 0.95 0.68 0.30  5.02 e Growing Sea	0.00 0.00 7.17 6.67 3.97  17.23 son: 5/1 - 8/8	0.00 0.79 7.88 7.58 4.39  18.63
April May June July August September October Season Crop: Si April May June July	 0.63 3.24 8.83 8.26 4.69  25.65 mall Grain 3.29 7.83 7.67	0.30 1.60 1.63 1.59 0.72  6,42 Averag	0.15 0.93 0.95 0.68 0.30  5.02 e Growing Sea  0.46 1.24 0.89	0.00 0.00 7.17 6.67 3.97  17.23 son: 5/1 - 8/8	0.00 0.79 7.88 7.58 4.39  18.63
April May June July August September October Season Crop: Si April May June July August	 0.63 3.24 8.83 8.26 4.69  25.65 mall Grain  3.29 7.83	0.30 1.60 1.63 1.59 0.72  6.42 Averag	0.15 0.93 0.95 0.68 0.30  5.02 e Growing Sea	0.00 0.00 7.17 6.67 3.97  17.23 son: 5/1 - 8/8	0.00 0.79 7.88 7.58 4.39  18.63
April May June July August September October Season Crop: Season April May June July August September	 0.63 3.24 8.83 8.26 4.69  25.65 mall Grain  3.29 7.83 7.67 0.68	0.30 1.60 1.63 1.59 0.72  6,42 Averag	0.15 0.93 0.95 0.68 0.30  5.02 e Growing Sea  0.46 1.24 0.89 0.09	0.00 0.00 7.17 6.67 3.97  17.23 son: 5/1 - 8/8  0.28 5.78 6.13 0.40 	0.00 0.79 7.88 7.58 4.39  18.63 3 0.83 6.59 6.78 0.59
April May June July August September October Season Crop: Si	 0.63 3.24 8.83 8.26 4.69  25.65 mall Grain  3.29 7.83 7.67 0.68	0.30 1.60 1.63 1.59 0.72  6,42 Averag	0.15 0.93 0.95 0.68 0.30  5.02 e Growing Sea  0.46 1.24 0.89 0.09	0.00 0.00 7.17 6.67 3.97  17.23 son: 5/1 - 8/8  0.28 5.78 6.13 0.40	0.00 0.79 7.88 7.58 4.39  18.63 3

Climatic Area III

Carryover Soil Moisture 2.0" - Net Irrigation Application 1.5"

Month   (Inches)   Normal Year   Dry Year   Normal Year   Dry	(	Consumptive		Rainfall		rigation
April	Я	Use				
May	nth	(Inches)	Normal Year	Dry Year	Normal Yea	r Dry Year
May	op: Po	tatoes	Avera	age Growing Sea	ison: 6/2 - 9	9/15
June         4.25         1.58         0.91         0.67         1.3           July         8.00         1.57         0.89         6.43         7.1           August         7.59         1.51         0.65         6.08         6.9           September         2.24         0.33         0.15         1.91         2.0           October                 Season         22.08         5.34         4.21         14.74         15.8           Crop:         Field Beans         Average Growing Season: 6/2 - 9/15           April                July         6.35         1.43         0.88         0.00         0.2           July         6.35         1.43         0.88         0.00         0.2           September         2.24         0.33         0.15         1.91         2.0            October                 Season         18.78         5.10         3.98         11.68         12.8           Crop:         Grass         Average Gro	1					
July         8.00         1.57         0.89         6.43         7.1           August         7.59         1.51         0.65         6.08         6.9           September         2.24         0.33         0.15         1.91         2.0           October                 Season         22.08         5.34         4.21         14.74         15.8           Crop:         Field Beans         Average Growing Season: 6/2 - 9/15           April                July         6.35         1.43         0.80         4.54         5.5           August         7.07         1.48         0.63         5.59         6.4           September         2.24         0.33         0.15         1.91         2.0           October                Season         18.78         5.10         3.98         11.68         12.8           April                May         3.41         1.02         0.46         <						
July         8.00         1.57         0.89         6.43         7.1           August         7.59         1.51         0.65         6.08         6.9           September         2.24         0.33         0.15         1.91         2.0           October                 Season         22.08         5.34         4.21         14.74         15.8           Crop:         Field Beans         Average Growing Season: 6/2 - 9/15           April                May                 June         3,12         1.50         0.88         0.00         0.2         0.2           July         6.35         1.43         0.80         4.54         5.5         0.4         5.59         6.4         5.59         6.4         5.59         6.4         2.2         0.60         0.2         0.2         0.2         0.2         0.2         0.2         0.2         0.2         0.2         0.2         0.2         0.2         0.2         0.2         0.2         0.2		4.25	1.58	0.91	0.67	1.34
September   2.24   0.33   0.15   1.91   2.00				0.89	6.43	7,11
September         2.24         0.33         0.15         1.91         2.0           October                Season         22.08         5.34         4.21         14.74         15.8           Crop:         Field Beans         Average Growing Season: 6/2 - 9/15           April               May               Jule         3.12         1.50         0.88         0.00         0.2           July         6.35         1.43         0.80         4.54         5.5           August         7.07         1.48         0.63         5.59         6.4           September         2.24         0.33         0.15         1.91         2.0           October                Season         18.78         5.10         3.98         11.68         12.8           April                 May         3.41         1.02         0.46         0.39         0.9		7.59	1,51		6.08	6.94
Season         22.08         5.34         4.21         14.74         15.8           Crop:         Field Beans         Average Growing Season: 6/2 - 9/15           April	ember	2.24	0.33	0.15	1,91	2.09
Crop:         Field Beans         Average Growing Season: 6/2 - 9/15           April   <	ber					
April	on	22.08	5.34	4,21	14.74	15.87
May	op: Fie	ld Beans	Avera	ge Growing Sea	son: 6/2 - 9/	15
May	1					
July         6.35         1.43         0.80         4.54         5.5           August         7.07         1.48         0.63         5.59         6.4           September         2.24         0.33         0.15         1.91         2.0           October  -						wn *==
July         6,35         1.43         0,80         4.54         5.5           August         7.07         1.48         0.63         5.59         6,4           September         2.24         0.33         0.15         1.91         2,0           October  -		3,12	1.50	0.88	0.00	0.24
August       7.07       1.48       0.63       5.59       6,4         September:       2.24       0.33       0.15       1.91       2,0         October               Season       18.78       5.10       3.98       11.68       12.8         Crop:       Grass       Average Growing Season:       5/1 - 10/8         April              May       3.41       1.02       0.46       0.39       0.9         June       5.92       1.85       1.08       4.07       4.8         July       7.51       1.54       0.88       5.97       6.6         August       6.62       1.42       0.58       5.20       6.0         September:       3.32       0.68       0.28       2.64       3.0         October       0.47       0.07       0.03       0.40       0.4         Season       27.25       7.34       5.70       17.91       19.5         Average Growing Season:	- 1	6.35	1.43	0,80		5.55
October <t< td=""><td>st  </td><td>7.07</td><td>1.48</td><td>0.63</td><td>5.59</td><td>6,44</td></t<>	st	7.07	1.48	0.63	5.59	6,44
October <t< td=""><td>ember</td><td>2.24</td><td>0.33</td><td>0.15</td><td>1.91</td><td>2,09</td></t<>	ember	2.24	0.33	0.15	1.91	2,09
Crop:         Grass         Average Growing Season:         5/1 - 10/8           April               May         3.41         1.02         0.46         0.39         0.9           June         5.92         1.85         1.08         4.07         4.8           July         7.51         1.54         0.88         5.97         6.6           August         6.62         1.42         0.58         5.20         6.0           September         3.32         0.68         0.28         2.64         3.0           October         0.47         0.07         0.03         0.40         0.4           Season         27.25         7.34         5.70         17.91         19.5           Crop:         Average Growing Season:	ber					
April	on .	18.78	5.10	3.98	11,68	12,80
May       3.41       1.02       0.46       0.39       0.9         June       5.92       1.85       1.08       4.07       4.8         July       7.51       1.54       0.88       5.97       6.6         August       6.62       1.42       0.58       5.20       6.0         September       3.32       0.68       0.28       2.64       3.0         October       0.47       0.07       0.03       0.40       0.4         Season       27.25       7.34       5.70       17.91       19.5         Average Growing Season:         May       June       July       July </td <td></td> <td>ss</td> <td></td> <td></td> <td>'</td> <td><del></del></td>		ss			'	<del></del>
June     5.92     1.85     1.08     4.07     4.8       July     7.51     1.54     0.88     5.97     6.6       August     6.62     1.42     0.58     5.20     6.0       September     3.32     0.68     0.28     2.64     3.0       October     0.47     0.07     0.03     0.40     0.4       Season     27.25     7.34     5.70     17.91     19.5       Crop:     Average Growing Season:	<u> </u>	2 / 1				<del></del>
July     7.51     1.54     0.88     5.97     6.6       August     6.62     1.42     0.58     5.20     6.0       September     3.32     0.68     0.28     2.64     3.0       October     0.47     0.07     0.03     0.40     0.4       Season     27.25     7.34     5.70     17.91     19.5       Crop:     Average Growing Season:       May     June       July     August						
August 6.62 1.42 0.58 5.20 6.00 September 3.32 0.68 0.28 2.64 3.00 October 0.47 0.07 0.03 0.40 0.40 Season 27.25 7.34 5.70 17.91 19.5  Crop: Average Growing Season:  April May June July August 0.62 1.42 0.58 5.20 6.00 Average Growing Season 0.40 0.40 Average Growing Season:						
September:       3.32       0.68       0.28       2.64       3.0         October:       0.47       0.07       0.03       0.40       0.4         Season:       27.25       7.34       5.70       17.91       19.5         Crop:       Average Growing Season:         April       May         June       July         August       August						
October         0.47         0.07         0.03         0.40         0.4           Season         27.25         7.34         5.70         17.91         19.5           Crop:         Average Growing Season:           May         June           July         August						
Season         27.25         7.34         5.70         17.91         19.5           Crop:         Average Growing Season:           April         May         June         July         July         August		<u> </u>		0.23		
Crop: Average Growing Season:  April			·			
May June July August						
May June July August	1					
June July August						
July August Superior						
August						
September						
October						
Season						

## ESTIMATED SEASONAL AND MONTHLY CONSUMPTIVE USE

Climatic Area IV

Carryover Soil Moisture 2.0" - Net Irrigation Application 1.5"

Ä	Consumptive Use	Effective (Inche		Net Irr (Inch	igation nes)
Month	(Inches)	Normal Year	Dry Year	Normal Year	
Crop: Alf	`alfa	Averag	e Growing Sea	son: 4/15 - 10	)/15
April	1.77	0.31	0.19	0.00	0.00
May	5.35	1.27	0.65	3.54	4.28
June	6.50	2.17	1.42	4.33	5.08
July	7.92	1,51	0.67	6,41	7.25
August	7.29	1.16	0,51	6.13	6.78
September	4.15	0.65	0.28	3,50	3.87
October	1.29	0.15	0.06	1,14	1.23
Season	34.19	8.44	6.56	23.75	25.63
Crop: Co			s Growing Sea	son: 5/18 - 9/	22 .
May	1.51	0.45	0.22	0.00	
June	5.00	2.00	1.30	2.06	0.00 2.99
July	8.68	1.58	0.68	7,10	
August	7.74	1.18	0.61	6.56	8.00 7.13
September	2.94	0.41	0.19	2.53	$\frac{7.13}{2.75}$
October Season	25.87	6,39	<u></u> 5.05	17.48	18.82
October Season Crop: Su	25.87	6,39 Average	5.05 Growing Seas	17.48 son: 5/15 - 10,	18.82 /1
October Season Crop: Su	25.87 gar Beets	6,39 Average	5.05 Growing Seas	17.48 son: 5/15 - 10,	18.82 /1
October Season Crop: Su April	25.87 gar Beets  0.98	6.39 Average	5.05 Growing Seas  0.26	17.48  50n: 5/15 - 10, 0.00	18.82
October Season Crop: Su April May June	25.87 gar Beets 0.98 4.00	6,39 Average	5.05 Growing Seas 0.26 1.23	17.48  50n: 5/15 - 10,   0.00  0.55	18.82 /1  0.00 1.49
October Season Crop: Su April May June July	25.87 gar Beets  0.98 4.00 9.27	 6.39 Average  0.54 1.89 1.61	5.05 Growing Seasons 0.26 1.23 0.71	17.48  17.48  50n: 5/15 - 10,   0.00  0.55  7.66	18.82 /1 0.00 1.49 8.56
October Season Crop: Su April May June July August	25.87  gar Beets  0.98 4.00 9.27 8.42	 6.39 Average 0.54 1.89 1.61 1.22	 5.05 Growing Seas  0.26 1.23 0.71 0.54	17.48  son: 5/15 - 10,  0.00 0.55 7.66 7.20	18.82 /1 0.00 1.49 8.56 7.88
October Season Crop: Su April May June July August September:	25.87 gar Beets  0.98 4.00 9.27	 6.39 Average  0.54 1.89 1.61	5.05 Growing Seasons 0.26 1.23 0.71	17.48  17.48  50n: 5/15 - 10,   0.00  0.55  7.66	18.82 /1 0.00 1.49 8.56 7.88 4.76
October Season	25.87 gar Beets 0.98 4.00 9.27 8.42 5.05	6.39  Average 0.54 1.89 1.61 1.22 0.68	 5.05 Growing Seas  0.26 1.23 0.71 0.54 0.29	17.48  son: 5/15 - 10,  0.00 0.55 7.66 7.20	18.82 /1 0.00 1.49 8.56 7.88 4.76
October Season Crop: Su April May June July August September: October	25.87  gar Beets  0.98 4.00 9.27 8.42 5.05 27.72		 5.05 Growing Seas  0.26 1.23 0.71 0.54 0.29	17.48 son: 5/15 - 10,	18.82 /1 0.00 1.49 8.56 7.88 4.76 20.36
October Season  Crop: Su  April May June July August September October Season	25.87  gar Beets  0.98 4.00 9.27 8.42 5.05 27.72		 5.05 Growing Seas 0.26 1.23 0.71 0.54 0.29  5.36	17.48  son: 5/15 - 10,  0.00 0.55 7.66 7.20 4.37 18.92  son: 4/15 - 7/	18.82 /1 0.00 1.49 8.56 7.88 4.76 20.36
October Season  Crop: Su  April May June July August September October Season  Crop: Sma	25.87  gar Beets  0.98 4.00 9.27 8.42 5.05 27.72  all Grain 1.00	 6.39 Average 0.54 1.89 1.61 1.22 0.68  6.80 Average	5.05 Growing Seas  0.26 1.23 0.71 0.54 0.29 5.36 Growing Seas	17.48  son: 5/15 - 10,  0.00 0.55 7.66 7.20 4.37 18.92  son: 4/15 - 7/	18.82 /1 0.00 1.49 8.56 7.88 4.76 20.36
October Season  Crop: Su  April May June July August September: October Season  Crop: Sma  April May June	25.87  gar Beets  0.98 4.00 9.27 8.42 5.05 27.72  all Grain  1.00 5.84 7.92		5.05 Growing Season 1.23 0.71 0.54 0.29 5.36 Growing Season 1.23	17.48  son: 5/15 - 10,  0.00 0.55 7.66 7.20 4.37 18.92  son: 4/15 - 7,	18.82 /1 0.00 1.49 8.56 7.88 4.76 20.36 /24
October Season Crop: Su April May June July August September: October Season Crop: Sma	25.87  gar Beets  0.98 4.00 9.27 8.42 5.05 27.72  all Grain  1.00 5.84		5.05 Growing Seasons 0.26 1.23 0.71 0.54 0.29 5.36 Growing Seasons 0.16 0.65	17.48  son: 5/15 - 10,	18.82 /1 0.00 1.49 8.56 7.88 4.76 20.36 /24
October Season  Crop: Su  April May June July August September: October Season  Crop: Sma  April May June	25.87  gar Beets  0.98 4.00 9.27 8.42 5.05 27.72  all Grain  1.00 5.84 7.92 4.10		5.05 Growing Seas  0.26 1.23 0.71 0.54 0.29 5.36 Growing Seas  0.16 0.65 1.57 0.40	17.48  son: 5/15 - 10,  0.00 0.55 7.66 7.20 4.37 18.92  son: 4/15 - 7/ 2.24 5.55 3.14	18.82 /1  0.00 1.49 8.56 7.88 4.76 20.36 /24  3.03 6.35 3.70
October Season  Crop: Su  April May June July August September October Season  Crop: Sma  April May June July August	25.87  gar Beets  0.98 4.00 9.27 8.42 5.05 27.72  all Grain  1.00 5.84 7.92		 5.05 Growing Seas 0.26 1,23 0.71 0.54 0.29  5.36 Growing Seas 0.16 0.65 1.57	17.48  son: 5/15 - 10,	18.82 /1  0.00 1.49 8.56 7.88 4.76 20.36  /24  3.03 6.35 3.70
October Season  Crop: Su  April May June July August September: October Season  Crop: Sma  April May June July	25.87  gar Beets  0.98 4.00 9.27 8.42 5.05 27.72  all Grain  1.00 5.84 7.92 4.10		5.05 Growing Seas  0.26 1.23 0.71 0.54 0.29 5.36 Growing Seas  0.16 0.65 1.57 0.40	17.48  son: 5/15 - 10,  0.00 0.55 7.66 7.20 4.37 18.92  son: 4/15 - 7/  2.24 5.55 3.14	18.82 /1  0.00 1.49 8.56 7.88 4.76 20.36 /24  3.03 6.35 3.70

# TABLE 3.1 ESTIMATED SEASONAL AND MONTHLY CONSUMPTIVE USE

Climatic Area IV

Carryover Soil Moisture 2.0" - Net Irrigation Application 1.5"

	Consumptive Use	Effective Rainfall (Inches)			rigation hes)
Month	(Inches)	Normal Year		Normal Yea	
Crop: Po	tatoes	Avera	ge Growing Sea	son: 5/30 -	9/15
April					
May	0.12	0.05	0.02	1	
June	4.74	1.97	1.26	ļ	0.58
July	8.43	1.55	0.69	6.72	7,74
August	7.75	1.16	0.52	6.59	7.23
September	2.30	0.28	0.13	2.02	2.17
October					
Season	23.24	5.67	4.47	15.57	16.77
Crop: F	ield Beans		ge Growing Sea		··
May	0.09	0.05	0,02		<del> </del>
June	<del></del>	1.84	1.20		
July	3.43	1.39	0.60	3.90	5.36
August	7.22	1.14	0.51	6.08	6.71
September:	2.35	0.29	0.13	2.06	2.22
October		0.27		2.00	2.22
	11				
Season	19.76	5.37	4.18	12,39	13.58
Crop: G	rass	Avera	ge Growing Sea		
Crop: G	1.37				10/15
Crop: G	rass	Avera	ge Growing Sea	son: 4/15 - :	10/15  1.91
Crop: G	1.37 4.29	Avera 0.31 1,20	ge Growing Sea 0.15 0.60	son: 4/15 - :	10/15  1.91 4.81
Crop: G	1.37 4.29 6.21 7.76	0.31 1,20 2.15 1.49	ge Growing Sea 0.15 0,60 1.40	son: 4/15 - 1 1.15 4.06 6.27 5.59	10/15  1.91 4.81 7,11
Crop: G	1.37 4.29 6.21 7.76 6.68 3.72	0.31 1,20 2.15 1.49 1.09 0.62	ge Growing Sea 0.15 0.60 1.40 0.65 0.47 0.28	1.15 4.06 6.27 5.59 3.10	10/15  1.91 4.81
Crop: G	1.37 4.29 6.21 7.76 6.68	0.31 1,20 2.15 1.49 1.09	ge Growing Sea 0.15 0.60 1.40 0.65 0.47 0.28 0.06	son: 4/15 - 1 1.15 4.06 6.27 5.59	10/15  1.91 4.81 7.11 6.21
Crop: G	1.37 4.29 6.21 7.76 6.68 3.72	0.31 1,20 2.15 1.49 1.09 0.62	ge Growing Sea 0.15 0.60 1.40 0.65 0.47 0.28	1.15 4.06 6.27 5.59 3.10	10/15  1.91 4.81 7.11 6.21 3.44
Crop: Grant April May June July August September October Season Crop:	1.37 4.29 6.21 7.76 6.68 3.72 0.99	0.31 1,20 2.15 1.49 1.09 0.62 0.13 8.14	ge Growing Sea 0.15 0.60 1.40 0.65 0.47 0.28 0.06	1.15 4.06 6.27 5.59 3.10 0.86 20.88	10/15  1.91 4.81 7,11 6.21 3.44 0.93
Crop: Grapsil May June July August September October Season Crop:	1.37 4.29 6.21 7.76 6.68 3.72 0.99	0.31 1,20 2.15 1.49 1.09 0.62 0.13 8.14	0.15 0.60 1.40 0.65 0.47 0.28 0.06 6.40	1.15 4.06 6.27 5.59 3.10 0.86 20.88	10/15  1.91 4.81 7,11 6.21 3.44 0.93
Crop: Graphil May June July August September October Season Crop:	1.37 4.29 6.21 7.76 6.68 3.72 0.99	0.31 1,20 2.15 1.49 1.09 0.62 0.13 8.14	0.15 0.60 1.40 0.65 0.47 0.28 0.06 6.40	1.15 4.06 6.27 5.59 3.10 0.86 20.88	10/15  1.91 4.81 7,11 6.21 3.44 0.93
Crop: Graphia May June July August September October Season Crop: April May June	1.37 4.29 6.21 7.76 6.68 3.72 0.99 31.02	0.31 1,20 2.15 1.49 1.09 0.62 0.13 8.14	0.15 0.60 1.40 0.65 0.47 0.28 0.06 6.40	1.15 4.06 6.27 5.59 3.10 0.86 20.88	10/15  1.91 4.81 7,11 6.21 3.44 0.93
Crop: Graphia May June July August September October Season Crop: April May June July	1.37 4.29 6.21 7.76 6.68 3.72 0.99 31.02	0.31 1,20 2.15 1.49 1.09 0.62 0.13 8.14	0.15 0.60 1.40 0.65 0.47 0.28 0.06 6.40	1.15 4.06 6.27 5.59 3.10 0.86 20.88	10/15  1.91 4.81 7,11 6.21 3.44 0.93
Crop: Graps	1.37 4.29 6.21 7.76 6.68 3.72 0.99 31.02	0.31 1,20 2.15 1.49 1.09 0.62 0.13 8.14	0.15 0.60 1.40 0.65 0.47 0.28 0.06 6.40	1.15 4.06 6.27 5.59 3.10 0.86 20.88	10/15  1.91 4.81 7,11 6.21 3.44 0.93
Crop: Grapsil May June July August September October Season Crop:  April May June July August September Season Season Season Season September Season September Septemb	1.37 4.29 6.21 7.76 6.68 3.72 0.99 31.02	0.31 1,20 2.15 1.49 1.09 0.62 0.13 8.14	0.15 0.60 1.40 0.65 0.47 0.28 0.06 6.40	1.15 4.06 6.27 5.59 3.10 0.86 20.88	10/15  1.91 4.81 7.11 6.21 3.44 0.93
Crop: Graps	1.37 4.29 6.21 7.76 6.68 3.72 0.99 31.02	0.31 1,20 2.15 1.49 1.09 0.62 0.13 8.14	0.15 0.60 1.40 0.65 0.47 0.28 0.06 6.40	1.15 4.06 6.27 5.59 3.10 0.86 20.88	10/15  1.91 4.81 7,11 6.21 3.44 0.93

3-12

# ESTIMATED SEASONAL AND MONTHLY CONSUMPTIVE USE

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Climatic Area I
Carryover Soil Moisture 3.0" - Net Irrigation Application 3.0"

	Consumptive Use	Effective (Inch	es)	Net Irr (Inch	igation nes)
Month	(Inches)	Normal Year	Dry Year	Normal Year	Dry Year
Crop: A	lfalfa	Avera	ge Growing Sea	ason: 5/1 - 10	)/8
April					
May	4,59	1.60	0.90		0.69
June	5.95	2.43	1.60	3.52	4.35
July	7.34	2.19	1.26	5.15	6.08
August	6.41	1.48	0,90	4,93	5.51
September	3.53	0.85	0,35	2.68	3.18
October	0.56	0.23	0.08	0.33	0.48
Season	28.38	9.88	7.69	15.50	17.69
Crop: Co	rn 	Averag	ge Growing Sea		· · · · · · · · · · · · · · · · · · ·
May	1,07	0.48	0.23		
June	4.48	2,26			
July	8.12	2.27	1.52 1.30	5 66	0.80
August	7.11	1.66	0.95	5.66	6.82
September:	2.43	0.56	0.23	5.45	6.16
October			U.Z)	1.87	2.20
Season	23.21	7.97	6.26		
			0.20	12.24	13.95
Crop: Sug			e Growing Seas		0/1
	gar Beets	Averag	e Growing Sea	son: 5/20 - 10	D/1 
April !	gar Beets	Averag	e Growing Seas	son: 5/20 - 10	0/1
April   May   June   July	gar Beets 0.61	Averag	e Growing Sea	son: 5/20 - 10	0/1
April   May   June   July   August	gar Beets 0.61 3.08	Averag 0.44 2.10	e Growing Seas 0.22 1.40	son: 5/20 - 10	0/1
April   May   June   July   August   September	7.81	Averag 0.44 2.10 2.28	e Growing Seas 0.22 1.40 1.30	son: 5/20 - 10	0/1  6.13 6.86
April   May   June   July   August   September	gar Beets 0.61 3.08 8.36	Averag  0.44 2.10 2.28 1.60	e Growing Seas 0.22 1.40 1.30 0.95	son: 5/20 - 10	0/1
April   May   June   July   August	7.81	Averag  0.44 2.10 2.28 1.60 0.88	0.22 1.40 1.30 0.95 0.38	son: 5/20 - 10 4.23 6.21 3.49	0/1  6.13 6.86 3.99
April   May   June   July   August   September   October   Season   Crop: Sm	gar Beets  0.61 3.08 8.36 7.81 4.37	Averag  0.44 2.10 2.28 1.60 0.88 8.29	e Growing Seas  0.22 1.40 1.30 0.95 0.38	5/20 - 10 4.23 6.21 3.49 12.94	6.13 6.86 3.99
April   May   June   July   August   September   October   Season   Crop: Sm	0.61 3.08 8.36 7.81 4.37 	Averag  0.44 2.10 2.28 1.60 0.88 8.29  Averag	e Growing Seas  0.22 1.40 1.30 0.95 0.38  6.37	son: 5/20 - 10 4.23 6.21 3.49 12.94	6.13 6.86 3.99
April   May June   July   August   September   October   Season   Crop: Sn	0.61 3.08 8.36 7.81 4.37  24.23 mall Grain	Averag  0.44 2.10 2.28 1.60 0.88 8.29  Averag	e Growing Seas 0.22 1.40 1.30 0.95 0.38  6.37 e Growing Seas	son: 5/20 - 10  4.23 6.21 3.49 12.94  son: 5/1 - 8/8	6.13 6.86 3.99 14.86
April   May June   July   August   September   October   Season   Crop: Sn April   May June   May June	0.61 3.08 8.36 7.81 4.37  24.23 mall Grain	Averag  0.44 2.10 2.28 1.60 0.88 8.29  Averag	e Growing Seas  0.22 1.40 1.30 0.95 0.38 6.37 e Growing Seas	son: 5/20 - 10  4.23 6.21 3.49 12.94  son: 5/1 - 8/8	0/1  6.13 6.86 3.99  14.86
April   May   June   July   August   September   October   Season   Crop: Sm  April   May   June   July   July   August   April   Apri	0.61 3.08 8.36 7.81 4.37  24.23 mall Grain  3.12 7.42 7.26	Averag  0.44 2.10 2.28 1.60 0.88 8.29  Averag  1.52 2.65 2.15	e Growing Seas 0.22 1.40 1.30 0.95 0.38  6.37 e Growing Seas	son: 5/20 - 10  4.23 6.21 3.49 12.94  son: 5/1 - 8/8	0/1  6.13 6.86 3.99  14.86
April   May   June   July   August   September   October   Season   Crop: Sm  April   May   June   July   August   Augus	0.61 3.08 8.36 7.81 4.37  24.23 mall Grain	Averag  0.44 2.10 2.28 1.60 0.88 8.29  Averag	e Growing Seas  0.22 1.40 1.30 0.95 0.38 6.37 e Growing Seas	son: 5/20 - 10  4.23 6.21 3.49 12.94  son: 5/1 - 8/8	6.13 6.86 3.99  14.86
April   May   June   July   August   September   October   Season   Crop: Sm  April   May   June   July   August   September   August   September   Se	0.61 3.08 8.36 7.81 4.37  24.23 mall Grain  3.12 7.42 7.26	Averag  0.44 2.10 2.28 1.60 0.88 8.29  Averag  1.52 2.65 2.15	e Growing Seas  0.22 1.40 1.30 0.95 0.38 6.37  e Growing Seas  0.81 1.77 1.25	son: 5/20 - 10  4.23 6.21 3.49 12.94  son: 5/1 - 8/8	6.13 6.86 3.99  14.86
April   May   June   July   August   September   October   Season   Crop: Sm  April   May   June   July   July   August   April   Apri	0.61 3.08 8.36 7.81 4.37 24.23 mall Grain  3.12 7.42 7.26 0.81	Averag  0.44 2.10 2.28 1.60 0.88 8.29  Averag  1.52 2.65 2.15 0.30	e Growing Seas  0.22 1.40 1.30 0.95 0.38 6.37  e Growing Seas  0.81 1.77 1.25 0.17	son: 5/20 - 10  4.23 6.21 3.49 12.94  son: 5/1 - 8/8	6.13 6.86 3.99  14.86

TABLE 3.2
ESTIMATED SEASONAL AND MONTHLY CONSUMPTIVE USE

Climatic Area I
Carryover Soil Moisture 3.0" - Net Irrigation Application 3.0"

Crop: Potatoes		Consumptive Use	Effective (Inche	s)	(Inch	
April	Month	(Inches)	Normal Year	Dry Year	Normal Year	Dry Year
May	Crop: Po	tatoes	Averag	e Growing Sea	eson: 6/4 - 9/	15
June   3.69   1.92   1.26         July   7.42   2.20   1.27   3.99   5.58     August   7.25   1.58   0.97   5.67   6.28     September   2.09   0.40   0.19   1.69   1.90     October             Season   20.45   6.76   5.31   10.69   12.14     Crop: Field Beans   Average Growing Season: 6/4 - 9/15     April             June   2.75   1.80   1.19         July   5.86   2.00   1.13   1.81   3.29     August   6.69   1.51   0.90   5.18   5.79     September   2.17   0.40   0.16   1.77   2.01     October             Season   17.46   6.38   4.91   8.08   9.55     Crop: Grass   Average Growing Season: 5/1 - 9/30     April             May   3.24   1.90   0.81         July   5.69   2.44   1.60   1.59   3.52     July   7.19   2.17   1.26   5.02   5.93     August   6.12   1.47   0.90   4.65   5.22     September   2.78   0.80   0.34   1.98   2.44     Crop:   Average Growing Season:     April             Season   25.02   9.43   7.34   12.59   14.68     Crop:   Average Growing Season:     April   May   June   July   August   5.50   9.43   7.34   12.59   14.68     September   2.78   0.80   0.34   1.98   2.44     August   5.90   9.43   7.34   12.59   14.68     September   2.78   0.80   0.34   1.98   2.44     August   5.90   9.43   7.34   12.59   14.68     September   Sep	April			ex		
July	May					
July	June	3.69	1.92	1.26		
August	July	7.42			3.99	5,58
September   2.09	August	7.25		0.97	5.67	
October	September				1,69	
Crop: Field Beans	October					
Crop: Field Beans	Season	20.45	6.76	5.31	10.69	12.14
May						5
June         2.75         1.80         1.19             July         5.86         2.00         1.13         1.81         3.29           August         6.69         1.51         0.90         5.18         5.79           September         2.17         0.40         0.16         1.77         2.01           October                Season         17.46         6.38         4.91         8.08         9.55           Crop:         Grass         Average Growing Season: 5/1 - 9/30           April                May         3.24         1.90         0.81             June         5.69         2.44         1.60         1.59         3.52           July         7.19         2.17         1.26         5.02         5.93           August         6.12         1.47         0.90         4.65         5.22           September         2.78         0.80         0.34         1.98         2.44           October             <						<del></del>
July         5.86         2.00         1.13         1.81         3.29           August         6.69         1.51         0.90         5.18         5.79           September         2.17         0.40         0.16         1.77         2.01           October                Season         17.46         6.38         4.91         8.08         9.55           Crop:         Grass         Average Growing Season: 5/1 - 9/30           April               May         3.24         1.90         0.81             June         5.69         2.44         1.60         1.59         3.52           July         7.19         2.17         1.26         5.02         5.93           August         6.12         1.47         0.90         4.65         5.22           September         2.78         0.80         0.34         1.98         2.44           October                Season         25.02         9.43         7.34         12.59         14.68		<b>*</b> !			<del></del>	
August       6.69       1.51       0.90       5.18       5.79         September       2.17       0.40       0.16       1.77       2.01         October              Season       17.46       6.38       4.91       8.08       9.55         Crop: Grass         Average Growing Season: 5/1 - 9/30         April             May       3.24       1.90       0.81           July       5.69       2.44       1.60       1.59       3.52         July       7.19       2.17       1.26       5.02       5.93         August       6.12       1.47       0.90       4.65       5.22         September       2.78       0.80       0.34       1.98       2.44         October              Season       25.02       9.43       7.34       12.59       14.68         Average Growing Season:         April         May       3.10       3.10       3.10       3.10       3.10						
September:         2.17         0.40         0.16         1.77         2.01           October                Season         17.46         6.38         4.91         8.08         9.55           Crop:         Grass         Average Growing Season:         5/1 - 9/30           April               May         3.24         1.90         0.81             June         5.69         2.44         1.60         1.59         3.52           July         7.19         2.17         1.26         5.02         5.93           August         6.12         1.47         0.90         4.65         5.22           September:         2.78         0.80         0.34         1.98         2.44           October                 Season         25.02         9.43         7.34         12.59         14.68           Crop:         Average Growing Season:         Season:         Season:         Season:						
October <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
Season         17.46         6.38         4.91         8.08         9.55           Crop:         Grass         Average Growing Season: 5/1 - 9/30           April               May         3.24         1.90         0.81             June         5.69         2.44         1.60         1.59         3.52           July         7.19         2.17         1.26         5.02         5.93           August         6.12         1.47         0.90         4.65         5.22           September         2.78         0.80         0.34         1.98         2.44           October                Season         25.02         9.43         7.34         12.59         14.68           Average Growing Season:           April         May           July         August         September						
Crop:         Grass         Average Growing Season: 5/1 - 9/30           April              May         3.24         1.90         0.81            June         5.69         2.44         1.60         1.59         3.52           July         7.19         2.17         1.26         5.02         5.93           August         6.12         1.47         0.90         4.65         5.22           September         2.78         0.80         0.34         1.98         2.44           October                Season         25.02         9.43         7.34         12.59         14.68           Crop:         Average Growing Season:    Average Growing Season:						
April	Season	17.40	6,38	4.91	8.08	9.55
May       3.24       1.90       0.81           June       5.69       2.44       1.60       1.59       3.52         July       7.19       2.17       1.26       5.02       5.93         August       6.12       1.47       0.90       4.65       5.22         September:       2.78       0.80       0.34       1.98       2.44         October              Season       25.02       9.43       7.34       12.59       14.68         Average Growing Season:         April       May       June       July       July         August       September       September       September       September		rass	Average	e Growing Sea	son: 5/1 - 9/3	0
June       5.69       2.44       1.60       1.59       3.52         July       7.19       2.17       1.26       5.02       5.93         August       6.12       1.47       0.90       4.65       5.22         September       2.78       0.80       0.34       1.98       2.44         October               Season       25.02       9.43       7.34       12.59       14.68         Average Growing Season:         April       May       June       July         August       September       September	L					
July       7.19       2.17       1.26       5.02       5.93         August       6.12       1.47       0.90       4.65       5.22         September       2.78       0.80       0.34       1.98       2.44         October						
August       6.12       1.47       0.90       4.65       5.22         September       2.78       0.80       0.34       1.98       2.44         October  <						
September:       2.78       0.80       0.34       1.98       2.44         October:						
October <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
Season         25.02         9.43         7.34         12.59         14.68           Crop:         Average Growing Season:           April         May         June         July         July         July         September         Septe		· <del>-</del> <del>-</del> <del></del>		0.34		2.44
Crop: Average Growing Season:  April						
April May June July August September	Season	25.02	9.43	7.34 <u></u>	12.59	14.68
May June July August September			Average	e Growing Sea	son:	
June July August September						
July August September						
August September September		·				
September						
	August					
	September					
Uctober	October					
Season	Season					

Climatic Area II

Carryover Soil Moisture 3.0" - Net Irrigation Application 3.0"

Ì	Consumptive Use	Effective (Inch		Net Irr (Inch	rigation es)	
Month	(Inches)	Normal Year	Dry Year	Normal Year	Dry Year	
Crop: Al	falfa	Avera	ge Growing Sea	son: 4/15 - 10	/15	
April	1.71	0.63	0.33			
May	5.20	1.92	1.22	1.36	2.36	
June	6.42	2.74	1.55	3.68	4.87	
July	7.49	2.23	1.37	5.26	6.12	
August	6.49	1.94	1.20	4.55	5,29	
September	3.77	1,38	0,65	2.39	3.12	
October	1.09	0.38	0.10	0.71	0.99	
Season	32.17	11.88	9.52	17.29	19.65	
Crop: Cor		Avera		son: 5/16 - 9/2	·	
May	1.75	0.81	0.51			
June			1.45	0.43	1,80	
July	5.01 8.21	2.52 2.33	1.43	5.88	6,78	
August	7.27	2.03	1,28	5,24	5.99	
September:		1.02	0.42		2.54	
October	2 <b>.</b> 96	1.02	U.42	1.94		
Season				<del></del>	14.56	
Season	25.20	9.53	7.64	12.67	14.56	
Crop: Su	ıgar Beets	Averag	ge Growing Sea	12.67 son: 5/15 - 1	· · · · · · · · · · · · · · · · · · ·	
Crop: Su	ngar Beets	Avera	ge Growing Sea:	son: 5/15 - 1	0/1	
Crop: Su	gar Beets 0.97	Averag	ge Growing Seas	son: 5/15 - 1	0/1	
Crop: Su April   May June	gar Beets   0.97   3,95	Averag	ge Growing Seas  0,48 1.35	son: 5/15 - 1	0.09	
Crop: Su  April  May  June  July	0.97 3.95 8.77	Average 0.80 2.35 2.38	ge Growing Seas  0.48 1.35 1.45	son: 5/15 - 1	0.09	
Crop: Su  April  May  June  July  August	0.97 3.95 8.77 7.91	Average 0.80 2.35 2.38 2.10	ge Growing Seas  0.48 1.35 1.45 1.33	son: 5/15 - 10	0/1  0.09 7.32 6.58	
Crop: Su  April   May June   July August September	0.97 3.95 8.77	Average 0.80 2.35 2.38	ge Growing Seas  0.48 1.35 1.45	son: 5/15 - 1	0.09	
Crop: Su  April May June July August September: October	0.97 3.95 8.77 7.91 4.60	Average 0.80 2.35 2.38 2.10 1.44	 0.48 1.35 1.45 1.33 0,69	son: 5/15 - 10   5.16 5.81 3.16	0/1  0.09 7.32 6.58 3.91	
Crop: Su  April May June July August September: October Season	 0.97 3.95 8.77 7.91 4.60	Average 0.80 2.35 2.38 2.10 1.44 9.73	 0.48 1.35 1.45 1.33 0.69	5.16 5.81 3.16  13.47	0/1  0.09 7.32 6.58 3.91  15.34	
Crop: Su  April May June July August September October Season Crop: Si	 0.97 3.95 8.77 7.91 4.60  26.20	Average 0.69	7.86 Growing Season of the sea	5.16 5.81 3.16  13.47	0/1  0.09 7.32 6.58 3.91  15.34	
Crop: Su  April May June July August September October Season Crop: Sn  April	0.97 3.95 8.77 7.91 4.60  26.20	Average 0.80 2.35 2.38 2.10 1.44 9.73 Average	7.86  Ge Growing Seasons Seaso	son: 5/15 - 10 5.16 5.81 3.16 13.47 son: 4/15 - 7	0/1  0.09 7.32 6.58 3.91  15.34	
Crop: Su  April May June July August September October Season Crop: Sn  April May	0.97 3.95 8.77 7.91 4.60  26.20	Average 0.69	7.86 Growing Season O.35 1.23 1.72	5.16 5.16 5.81 3.16  13.47 son: 4/15 - 7	0/1 0.09 7.32 6.58 3.91 15.34 /24 3.87 6.14	
Crop: Su  April May June July August September October Season Crop: Sr  April May June	0.97 3.95 8.77 7.91 4.60 26.20  mall Grain  2.86 5.59	Average 0.69 1.97	7.86  Ge Growing Seasons Seaso	son: 5/15 - 10 5.16 5.81 3.16 13.47 son: 4/15 - 7	0/1   0.09  7.32  6.58  3.91   15.34  /24	
Crop: Su  April May June July August September October Season Crop: Sr  April May June July	0.97 3.95 8.77 7.91 4.60 26.20 mall Grain 2.86 5.59 7.86	Average 0.69 1.97 2.94	7.86 Growing Season O.35 1.23 1.72	5.16 5.16 5.81 3.16  13.47 son: 4/15 - 7	0/1 0.09 7.32 6.58 3.91 15.34 /24 3.87 6,14	
Crop: Su  April May June July August September: October Season Crop: Sr  April May June July August	0.97 3.95 8.77 7.91 4.60 26.20 mall Grain  2.86 5.59 7.86 3.89	Average  0.80 2.35 2.38 2.10 1.44 9.73  Average  0.69 1.97 2.94 1.44	7.86  Ge Growing Seasons Seaso	son: 5/15 - 10	0/1   0.09  7.32  6.58  3.91   15.34  /24   3.87  6.14  3.03	
Crop: Su  April May June July August September: October Season	0.97 3.95 8.77 7.91 4.60 26.20 mall Grain  2.86 5.59 7.86 3.89	Average  0.80 2.35 2.38 2.10 1.44 9.73  Average  0.69 1.97 2.94 1.44	7.86  Ge Growing Seasons of the seas	son: 5/15 - 10  5.16 5.81 3.16 13.47  son: 4/15 - 7  2.79 4.92 2.45	0/1  0.09 7.32 6.58 3.91 15.34  /24  3.87 6.14 3.03	

TABLE 3.2
ESTIMATED SEASONAL AND MONTHLY CONSUMPTIVE USE

Climatic Area II

Carryover Soil Moisture 3.0" - Net Irrigation Application 3.0"

	Consumptive Use	Effective (Inch		(Inc	rigation hes)
Month	(Inches)	Normal Year	Dry Year	Normal Yea	r Dry Year
Crop: Po	otatoes	Avera	ge Growing Sea	son: 5/30 - 9	9/1
April					
May	0.12	0.06	0.03		
June	4.79	2.47	1.42		0.46
July	8.21	2,32	1.45	5.27	6,76
August	6.70	1.97	1,22	4.73	5.48
September					
October					
Season	19.82	7.30	6.01	9.52	10.81
<u>-</u>	ield Beans		ge Growing Sea		·
April					
May	0.09	0.06	0.03		<del> </del>
June	3.38	2.28	1.33	2,33	1 02
July	6.30	2.10	1.29 1.22	4.80	4.03 5.55
August !	6.77	1.97		1.61	
September:	2.27	0.66	0.30		1.97
October				<u></u>	1 0 (2
Season	18.82	7.58	6.19	8.24	9,63
Crop: Gi	rass	Avera	ge Growing Sea	son: 4/15 - 1	10/15
April	1.28	0.65	0.31		<del> </del>
May	4.17	1.79	1.06	0.01	1.08
June !	6.13	2.67	1.53	3.46	4.60
July i	7.32	2.21	1.36	5.11	5.96
August	6.27	1.93	1.19	4.34	5,08
September:	3.39	1.35	0.65	2.04	2.74
October	0.87	0.33	0.10	0.54	0.77
Season	29.44	11.64	9.33	14.80	17.11
Crop:		Avera	ge Growing Sea	son:	
April					<b></b>
May					<b></b>
June					<u> </u>
July					
August					
September					<u> </u>
October					
Season					
		3-16			

Climatic Area III

Carryover Soil Moisture 3.0" - Net Irrigation Application 3.0"

	Consumptive Use	Effective (Inch	Rainfall		rigation hes)		
Month	(Inches)	Normal Year		Normal Yea			
Crop: Al	•	Avera	ge Growing Sea		<u>`</u>		
April							
May	4.84	1.27	0.57	0.57	1.27		
June	6.27	2.20	1,28	4.07	4.99		
July	7.76	1.80	1.02	5.96	6.74		
August	6.77	1,66	0.69	5.11	6.08		
September	3.79	0.80	0.33	2.99	3.46		
October	0.62	0.12	0.10	0.50	0.52		
Season	30.05	8.69	6.80	18.36	20.25		
Crop: Co		Avera	ge Growing Sea	5011: 5/18 =	<del></del>		
May	1.45	0.42	0.17				
June	4.94	2.01	1.16	0.96	2.06		
July	8.66	1.90	1.05	6.76	7,61		
August	7.37	1.76	0.76	5.61	6.61		
September:	2.09	0.40	0,16	1.69	1,93		
October							
Season	24.50	7.02	5.48	14.48	16.02		
Crop: Su		Avera	ge Growing Sea	son: 5/20 - 1	0/1		
May	0.63	0.35	0.17				
June	3.24	1.86	1.08				
July i	8.83	1.90	1.10	5.59	7.35		
August							
	8.26	1.85	0.79	6.41	7,47		
	8.26 4.69	1.85 0.84					
October	4.69 	0.84	0.79 0.35	6.41 3.85	7,47 4.34		
October	4.69	0.84	0.79 0.35	6.41 3.85	7,47		
	4.69 	0.84  7.47	0.79 0.35	6.41 3.85  15,18	7,47 4,34  16,81		
October   Season   Crop: Sm	4.69  25.65 all Grain	0.84  7.47 Averag	0.79 0.35  5.84	6.41 3.85  15,18	7,47 4.34  16.81		
October Season Crop: Sm April May	4.69  25.65 all Grain	0.84  7.47 Average	0.79 0.35  5.84 ge Growing Seas  0.53	6.41 3.85  15,18 son: 5/1 - 8/8	7,47 4.34  16.81		
October Season Crop: Sm April May June	4.69  25.65 all Grain  3.29 7.83	0.84  7.47 Average  1.17 2.38	0.79 0.35  5.84 ge Growing Seas  0.53 1.44	6.41 3.85  15,18 son: 5/1 - 8/8	7,47 4,34  1,16,81 3  6,15		
October Season Crop: Sm April May June July	4.69  25.65 all Grain  3.29 7.83 7.67	0.84  7.47 Average	0.79 0.35  5.84 ge Growing Seas  0.53	6.41 3.85  15,18 son: 5/1 - 8/8	7,47 4.34  16.81		
October Season Crop: Sm April May June July August	4.69  25.65 all Grain  3.29 7.83	0.84  7.47 Average  1.17 2.38	0.79 0.35  5.84 ge Growing Seas  0.53 1.44	6.41 3.85  15,18 son: 5/1 - 8/8	7,47 4,34  1,16,81 3  6,15		
October Season Crop: Sm April May June July August September	4.69  25.65 all Grain  3.29 7.83 7.67	0.84  7.47 Average  1.17 2.38 1.79	0.79 0.35  5.84 ge Growing Seas  0.53 1.44 1.04	6.41 3.85  15.18 son: 5/1 - 8/8  4.57 5.88	7.47 4.34  16.81 3  6.15 6.63		
October   Season	4.69  25.65 all Grain  3.29 7.83 7.67 0.68	0.84  7.47 Average  1.17 2.38 1.79 0.32	0.79 0.35  5.84 ge Growing Seas  0.53 1.44 1.04 0.11	6.41 3.85  15.18 son: 5/1 - 8/8  4.57 5.88 0.36	7,47 4,34  16,81 3  6,15 6,63 0,57		

TABLE 3.2
ESTIMATED SEASONAL AND MONTHLY CONSUMPTIVE USE

Climatic Area III

Carryover Soil Moisture 3.0" - Net Irrigation Application 3.0"

May		Consumptive Use	(Inch		(Incl	
April	Month	(Inches)	Normal Year	Dry Year	Normal Year	· Dry Year
May	Crop: Po	otatoes	Avera	ge Growing Sea	son: 6/2 <b>-</b> 9/	15
May	April					
July         8.00         1.83         1.03         5.58         6.97           August         7.59         1.76         0.76         5.83         6.83           September         2.24         0.38         0.17         1.86         2.07           October                Season         22.08         6.21         4.90         12.87         14.18           Crop: Field Beans         Average Growing Season: 6/2 - 9/15           April               June         3.12         1.74         1.02            June         3.12         1.74         1.02            July         6.35         1.66         0.93         3.07         4.52           August         7.07         1.72         0.73         5.35         6.34           September         2.24         0.38         0.17         1.86         2.07           October                Season         -18.78         5.93         4.63         9.85         11.15           Crop: <t< td=""><td></td><td> 1</td><td>+</td><td></td><td></td><td>†</td></t<>		1	+			†
July         8.00         1.83         1.03         5.58         6.97           August         7.59         1.76         0.76         5.83         6.83           September         2.24         0.38         0.17         1.86         2.07           October                 Season         22.08         6.21         4.90         12.87         14.18           Crop: Field Beans         Average Growing Season: 6/2 - 9/15           Average Growing Season: 6/2 - 9/15           April		4.25	1.84	1.06		<del></del>
August         7.59         1.76         0.76         5.83         6.83           September         2.24         0.38         0.17         1.86         2.07           October                 Season         22.08         6.21         4.90         12.87         14.18           Crop: Field Beans         Average Growing Season: 6/2 - 9/15           April               May               June         3.12         1.74         1.02            July         6.35         1.66         0.93         3.07         4.52           August         7.07         1.72         0.73         5.35         6.34           September         2.24         0.38         0.17         1.86         2.07           October                Season         -18.78         5.93         4.63         9.85         11.15           Crop: Grass         Average Growing Season: 5/1 - 10/8           April			1.83		5.58	
September   2.24   0.38   0.17   1.86   2.07				0.76		
Crop: Field Beans		2.24	0.38	0.17		
Season         22.08         6.21         4.90         12.87         14.18           Crop: Field Beans         Average Growing Season: 6/2 - 9/15           April                May                June         3.12         1.74         1.02             July         6.35         1.66         0.93         3.07         4.52           August         7.07         1.72         0.73         5.35         6.34           September         2.24         0.38         0.17         1.86         2.07           October                Season         18.78         5.93         4.63         9.85         11.15           Crop:         Grass         Average Growing Season: 5/1 - 10/8           April               July         7.51         1.79         1.03         5.72         6.48           August         6.62         1.65         0.67         4.97         5.95           September         -3.		<del></del>				1
April	Season	22.08	6.21	4.90	12,87	
May				ge Growing Sea	son: 6/2 - 9/3	L5
June     3.12     1.74     1.02         July     6.35     1.66     0.93     3.07     4.52       August     7.07     1.72     0.73     5.35     6.34       September:     2.24     0.38     0.17     1.86     2.07       October:           Season     *18.78     5.93     4.63     9.85     11.15       Crop: Grass       Average Growing Season:     5/1 - 10/8       April          May     3.41     1.19     0.53         June     5.92     2.15     1.26     2.99     4.54       July     -7.51     1.79     1.03     5.72     6.48       August     -6.62     1.65     0.67     4.97     5.95       September:     -3.32     0.79     0.33     2.53     2.99       October:     0.47     0.08     0.03     0.39     0.44       Season     27.25     8.53     6.63     15.72     17.62       Crop:     Average Growing Season:						
July         6.35         1.66         0.93         3.07         4.52           August         7.07         1.72         0.73         5.35         6.34           September         2.24         0.38         0.17         1.86         2.07           October                 Season         18.78         5.93         4.63         9.85         11.15           Crop: Grass         Average Growing Season: 5/1 - 10/8           April               June         5.92         2.15         1.26         2.99         4.54           July         -7.51         1.79         1.03         5.72         6.48           August         6.62         1.65         0.67         4.97         5.95           September         -3.32         0.79         0.33         2.53         2.99           October         0.47         0.08         0.03         0.39         0.44           Season         27.25         8.53         6.63         15.72         17.62           Crop:         Average Growing				<del>}}</del>		
August 7.07 1.72 0.73 5.35 6.34 September 2.24 0.38 0.17 1.86 2.07 October Season 18.78 5.93 4.63 9.85 11.15  Crop: Grass Average Growing Season: 5/1 - 10/8  April June 5.92 2.15 1.26 2.99 4.54 August 6.62 1.65 0.67 4.97 5.95 September 3.32 0.79 0.33 2.53 2.99 October 0.47 0.08 0.03 0.39 0.44 Season 27.25 8.53 6.63 15.72 17.62  Crop: Average Growing Season:  April May June June June June June June June June						
September         2.24         0.38         0.17         1.86         2.07           October                 Season         18.78         5.93         4.63         9.85         11.15           Crop: Grass         Average Growing Season: 5/1 - 10/8           April                May         3.41         1.19         0.53              June         5.92         2.15         1.26         2.99         4.54           July         7.51         1.79         1.03         5.72         6.48           August         6.62         1.65         0.67         4.97         5.95           September         3.32         0.79         0.33         2.53         2.99           October         0.47         0.08         0.03         0.39         0.44           Season         27.25         8.53         6.63         15.72         17.62           Average Growing Season:    September  October						
October <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
Season         18.78         5.93         4.63         9.85         11.15           Crop: Grass         Average Growing Season: 5/1 - 10/8           April				0.17	1.86	2.07
Crop: Grass						
April	Season	= 18.78	5,93	<u>4.63</u>	9.85	11.15
May       3.41       1.19       0.53           June       5.92       2.15       1.26       2.99       4.54         July	<u>-</u>	<del>п</del>			son: 5/1 - 10/	'8 
June     5.92     2.15     1.26     2.99     4.54       July     7.51     1.79     1.03     5.72     6.48       August     6.62     1.65     0.67     4.97     5.95       September     3.32     0.79     0.33     2.53     2.99       October     0.47     0.08     0.03     0.39     0.44       Season     27.25     8.53     6.63     15.72     17.62       Average Growing Season:       April     August       July     August       September     0.00     0.00     0.00       October     0.00     0.00     0.00     0.00       August     0.00     0.00     0.00     0.00     0.00       August     0.00     0.00     0.00     0.00     0.00     0.00       August     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00       September     0.00     0.0			<del></del>			****
July     7.51     1,79     1.03     5.72     6.48       August     6.62     1.65     0,67     4.97     5.95       September     3.32     0.79     0.33     2,53     2.99       October     0.47     0.08     0.03     0.39     0.44       Season     27.25     8.53     6.63     15.72     17.62       Crop:     Average Growing Season:       April     May     June     July       July     August     September     October						
August       6.62       1.65       0.67       4.97       5.95         September       3.32       0.79       0.33       2.53       2.99         October       0.47       0.08       0.03       0.39       0.44         Season       27.25       8.53       6.63       15.72       17.62         Crop:       Average Growing Season:         April       May       June       July         July       August       September       October       October						
September       3.32       0.79       0.33       2.53       2.99         October       0.47       0.08       0.03       0.39       0.44         Season       27.25       8.53       6.63       15.72       17.62         Crop:       Average Growing Season:         April       May         June       July         August       September         October       October						
October         0.47         0.08         0.03         0.39         0.44           Season         27.25         8.53         6.63         15.72         17.62           Crop:         Average Growing Season:           April         May         June         July           July         August         September         October						
Season         27.25         8.53         6.63         15.72         17.62           Crop:         Average Growing Season:           April         May         June         July           July         August         September         October						
Crop: Average Growing Season:  April May June July August September October						
May						21.02
June July August September October	April					
JulyAugustSeptemberOctober	May					
August         September           October         October	June					
September October	July					
October	August					
	September					
Season	October					
	Season					

Climatic Area IV

Carryover Soil Moisture 3.0" - Net Irrigation Application 3.0"

: <u>1</u> 1	Consumptive	Effective		Net Irrigation (Inches)			
36	Use	(Inche	<del></del>				
Month	(Inches)	Normal Year	Dry Year	Normal Year	Dry Year		
Crop: Al	lfalfa	Averag	ge Growing Sea	ason: 4/15 - 10	)/15		
April	1.77	0,36	0.22				
May	5.35 6,50	1.48	0.76	2.28	3,14		
June		2.52	1.65	3.98	4.85		
July	7.92	1.76	0,78	6.16	7.14		
August	7.29	1.35	0.59	5.94	6.70		
September	4.15	0.76	0.33	3.39	3.82		
October	1.29	0.17	0.07	1,12	1.22		
Season	34.19	9,81	7,63	21.38	23.56		
	orn	Averag	e Growing Sea	son: 5/18 - 9/	22		
April					~-		
May	1.51	0.52	0.26				
June	5.00	2.33	1.51	0.66	1.74		
July	8.68	1.84	0.79	6.84	. 7.89		
August	7.74	1.37	0.71	6.37	7.03		
September	2,94	0.48	0.22	2,46	2.72		
October			<u></u>				
Season	25.87	7.43	5.87	15.44 17.			
Cmam. C-							
	gar Beets		· · · · · · · · · · · · · · · · · · ·	son: 5/15 - 10	/1		
April				son: 5/15 - 10	/1		
April May	 0.98	0.63	 0,30	· · · · · · · · · · · · · · · · · · ·			
April   May June	 0.98 4.00	0.63 2,20	0,30 1,43		0.25		
April   May June July	 0.98 4.00 9.27	0.63 2,20 1.87	0.30 1.43 0.83	6.55	0.25 8.44		
April May June July August	 0.98 4.00 9.27 8.42	 0.63 2,20 1.87 1.42	0.30 1.43 0.83 0.63	  6.55 7.00	0.25 8.44 7.79		
April May June July August September	 0.98 4.00 9.27 8.42 5.05	 0.63 2,20 1.87 1.42 0,79	0.30 1.43 0.83 0.63 0.34	6.55	0.25 8.44 7.79 4.71		
April May June July August September October	 0.98 4.00 9.27 8.42 5.05	 0.63 2,20 1.87 1.42 0,79	0.30 1.43 0.83 0.63 0.34	 6.55 7.00 4.26	0.25 8.44 7.79 4.71		
April May June July August September October Season	 0.98 4.00 9.27 8.42 5.05	 0.63 2,20 1.87 1.42 0,79	0.30 1.43 0.83 0.63 0.34	  6.55 7.00	0.25 8.44 7.79 4.71		
April May June July August September October Season	 0.98 4.00 9.27 8.42 5.05	 0.63 2,20 1.87 1.42 0,79  7.91	0.30 1.43 0.83 0.63 0.34  6.23	 6.55 7.00 4.26	0.25 8.44 7.79 4.71		
April May June July August September October Season Crop: Sm	 0.98 4.00 9.27 8.42 5.05  27.72	 0.63 2,20 1.87 1.42 0,79  7.91	0.30 1.43 0.83 0.63 0.34  6.23	 6.55 7.00 4.26  16.81	0.25 8.44 7.79 4.71  18.49		
April May June July August September October Season Crop: Sm	 0.98 4.00 9.27 8.42 5.05  27.72	 0.63 2.20 1.87 1.42 0.79  7.91 Averag	0.30 1.43 0.83 0.63 0.34  6.23 e Growing Seas	 6.55 7.00 4.26  16.81 son: 4/15 - 7/2	0.25 8.44 7.79 4.71		
April May June July August September October Season Crop: Sm April May June	 0.98 4.00 9.27 8.42 5.05  27.72	 0.63 2,20 1.87 1.42 0,79  7.91 Averag	0.30 1.43 0.83 0.63 0.34  6.23 e Growing Seas 0.19 0.76 1.83	 6.55 7.00 4.26  16.81	0.25 8.44 7.79 4.71  18.49		
April May June July August September October Season Crop: Sm April May June July	 0.98 4.00 9.27 8.42 5.05  27.72 mall Grain	 0.63 2.20 1.87 1.42 0.79  7.91 Averag	0.30 1.43 0.83 0.63 0.34  6.23 e Growing Seas	 6.55 7.00 4.26  16.81 son: 4/15 - 7/2	0.25 8.44 7.79 4.71  18.49		
April May June July August September October Season Crop: Sm April May June July	 0.98 4.00 9.27 8.42 5.05  27.72 mall Grain 1.00 5.84 7.92	 0.63 2,20 1.87 1.42 0,79  7.91 Averag	0.30 1.43 0.83 0.63 0.34  6.23 e Growing Seas 0.19 0.76 1.83	 6.55 7.00 4.26  16.81 son: 4/15 - 7/2	0.25 8.44 7.79 4.71 		
April May June July August September October Season Crop: Sm April May June July August	 0.98 4.00 9.27 8.42 5.05  27.72 mall Grain 1.00 5.84 7.92 4.10	 0.63 2,20 1.87 1.42 0,79  7.91 Averag 0.36 1.50 2.75 1.12	0.30 1.43 0.83 0.63 0.34  6.23 e Growing Seas 0.19 0.76 1.83 0.46	 6.55 7.00 4.26  16.81 son: 4/15 - 7/2	0.25 8.44 7.79 4.71  18.49 24		
April May June July August September October Season	 0.98 4.00 9.27 8.42 5.05  27.72 mall Grain 1.00 5.84 7.92 4,10	 0.63 2,20 1.87 1.42 0,79  7.91 Averag 0.36 1.50 2.75 1.12	0.30 1.43 0.83 0.63 0.34  6.23 e Growing Seas 0.19 0.76 1.83 0.46	 6.55 7.00 4.26  16.81 son: 4/15 - 7/2	0.25 8.44 7.79 4.71 		

Climatic Area IV

Carryover Soil Moisture 3.0" - Net Irrigation Application 3.0"

i i	Consumptive Use	Effective (Inche	s)	Net Irrigation (Inches) Normal Year Dry Year			
Month	(Inches)	Normal Year	Dry Year	Normal Year	r Dry Year		
Crop: Po	otatoes	Averag	e Growing Sea	son: 5/30 - 9	/15		
April							
May	0.12	0.06	0.02				
June	4,74	2,29	1,47	-	0.37		
July	8.43	1.80	0,80	6.14	7.63		
August	7.75	1.35	0.60	6,40	7.15		
September	2.30	0.33	0.15	1.97	2.15		
October							
Season	23.24	6.59	5.20	13.65	15.04		
	ield Beans	Averag	e Growing Sea	son: 5/30 - 9/	15		
April							
May	0.09	0.06	0.02				
June	3.43	2.14	1,40				
July	6.66	1.62	0.70	3.36	5.06		
August !	7.22	1.33	0.59	5.89	6.63		
<u> </u>	2 25	0.34	0.15	2,01	2.20		
September	2.35	0.24			<del>                                     </del>		
September: October	2.37						
					11.90		
October Season Crop: Gr	19.76 rass	6,24 Averag	4.86 e Growing Sea	10.52 son: 4/15 - 1	11.90 0/15		
October Season Crop: Gr	19.76 rass	6.24 Averag	4.86 e Growing Sea	 10.52 son: 4/15 - 1	11.90 0/15		
October Season Crop: Gr April May	19.76 rass 1.37 4.29	6.24 Averag 0.36 1.40	4.86 e Growing Sea 0.17 0.70	 10.52 son: 4/15 - 1	11.90 0/15  1.79		
October Season Crop: Gr April May June	19.76 rass 1.37 4.29 6.21	6.24 Averag 0.36 1.40 2.50	4.86 e Growing Sea 0.17 0.70 1.63	 10.52 son: 4/15 - 1  0.90 3.71	11.90 0/15  1.79 4.58		
October Season Crop: Gr April May June July	19.76 rass 1.37 4.29 6.21 7.76	6.24 Averag  0.36 1.40 2.50 1.73	4.86 e Growing Sea 0.17 0.70 1.63 0.76	 10.52 son: 4/15 - 1  0.90 3.71 6.03	11.90 0/15  1.79 4.58 7.00		
October Season Crop: Gr April   May   June   July   August	19.76  1.37 4.29 6.21 7.76 6.68	 6.24 Averag 0.36 1.40 2.50 1.73 1.27	4.86 e Growing Sea 0.17 0.70 1.63 0.76 0.55	 10.52 son: 4/15 - 1  0.90 3.71 6.03 5.41	11.90 0/15  1.79 4.58 7.00 6.13		
October Season Crop: Gr April May June July August September	19.76  1.37 4.29 6.21 7.76 6.68 3.72	 6.24 Averag 0.36 1.40 2.50 1.73 1.27 0.72	4.86 e Growing Sea  0.17 0.70 1.63 0.76 0.55 0.33	 10.52 son: 4/15 - 1  0.90 3.71 6.03 5.41 3.00	11.90 0/15  1.79 4.58 7.00 6.13 3.39		
October Season Crop: Gr April May June July August September October	19.76  1.37 4.29 6.21 7.76 6.68 3.72 0.99	 6.24 Averag 0.36 1.40 2.50 1.73 1.27 0.72 0.15	4.86 e Growing Sea  0.17 0.70 1.63 0.76 0.55 0.33 0.07	 10.52 son: 4/15 - 1  0.90 3.71 6.03 5.41 3.00 0.84	11.90 0/15  1.79 4.58 7.00 6.13 3.39 0.92		
October Season Crop: Gr April   May June   July August September	19.76  1.37 4.29 6.21 7.76 6.68 3.72	 6.24 Averag 0.36 1.40 2.50 1.73 1.27 0.72	4.86 e Growing Sea  0.17 0.70 1.63 0.76 0.55 0.33	 10.52 son: 4/15 - 1  0.90 3.71 6.03 5.41 3.00	11.90 0/15  1.79 4.58 7.00 6.13 3.39		
October Season Crop: Gr April May June July August September October	19.76  1.37 4.29 6.21 7.76 6.68 3.72 0.99	6.24  Averag  0.36  1.40  2.50  1.73  1.27  0.72  0.15  9.47	4.86 e Growing Sea  0.17 0.70 1.63 0.76 0.55 0.33 0.07	 10.52 son: 4/15 - 1  0.90 3.71 6.03 5.41 3.00 0.84 18.55	11.90 0/15  1.79 4.58 7.00 6.13 3.39 0.92		
October Season  Crop: Gr April May June July August September October Season	19.76  1.37 4.29 6.21 7.76 6.68 3.72 0.99	6.24  Averag  0.36  1.40  2.50  1.73  1.27  0.72  0.15  9.47	4.86 e Growing Sea  0.17 0.70 1.63 0.76 0.55 0.33 0.07 7.44	 10.52 son: 4/15 - 1  0.90 3.71 6.03 5.41 3.00 0.84 18.55	11.90 0/15  1.79 4.58 7.00 6.13 3.39 0.92		
October Season  Crop: Gr  April   May June July August September October Season  Crop:	19.76  1.37 4.29 6.21 7.76 6.68 3.72 0.99	6.24  Averag  0.36  1.40  2.50  1.73  1.27  0.72  0.15  9.47	4.86 e Growing Sea  0.17 0.70 1.63 0.76 0.55 0.33 0.07 7.44	 10.52 son: 4/15 - 1  0.90 3.71 6.03 5.41 3.00 0.84 18.55	11.90 0/15  1.79 4.58 7.00 6.13 3.39 0.92		
October Season  Crop: Gr  April   May June July August September October Season  Crop:  April	19.76  1.37 4.29 6.21 7.76 6.68 3.72 0.99	6.24  Averag  0.36  1.40  2.50  1.73  1.27  0.72  0.15  9.47	4.86 e Growing Sea  0.17 0.70 1.63 0.76 0.55 0.33 0.07 7.44	 10.52 son: 4/15 - 1  0.90 3.71 6.03 5.41 3.00 0.84 18.55	11.90 0/15  1.79 4.58 7.00 6.13 3.39 0.92		
October Season  Crop: Gr  April May June July August September October Season  Crop:  April May  April May	19.76  1.37 4.29 6.21 7.76 6.68 3.72 0.99	6.24  Averag  0.36  1.40  2.50  1.73  1.27  0.72  0.15  9.47	4.86 e Growing Sea  0.17 0.70 1.63 0.76 0.55 0.33 0.07 7.44	 10.52 son: 4/15 - 1  0.90 3.71 6.03 5.41 3.00 0.84 18.55	11.90 0/15  1.79 4.58 7.00 6.13 3.39 0.92		
October Season  Crop: Gr  April May June July August September October Season  Crop:  April May June July April July April May June July	19.76  1.37 4.29 6.21 7.76 6.68 3.72 0.99	6.24  Averag  0.36  1.40  2.50  1.73  1.27  0.72  0.15  9.47	4.86 e Growing Sea  0.17 0.70 1.63 0.76 0.55 0.33 0.07 7.44	 10.52 son: 4/15 - 1  0.90 3.71 6.03 5.41 3.00 0.84 18.55	11.90 0/15  1.79 4.58 7.00 6.13 3.39 0.92		
October Season  Crop: Gr  April May June July August September October Season  Crop:  April May June July August	19.76  1.37 4.29 6.21 7.76 6.68 3.72 0.99 31.02	6.24  Averag  0.36  1.40  2.50  1.73  1.27  0.72  0.15  9.47	4.86 e Growing Sea  0.17 0.70 1.63 0.76 0.55 0.33 0.07 7.44	 10.52 son: 4/15 - 1  0.90 3.71 6.03 5.41 3.00 0.84 18.55	11.90 0/15  1.79 4.58 7.00 6.13 3.39 0.92		
October Season  Crop: Gr  April May June July August September October Season  Crop:  April May June July April July	19.76  1.37 4.29 6.21 7.76 6.68 3.72 0.99 31.02	6.24  Averag  0.36  1.40  2.50  1.73  1.27  0.72  0.15  9.47	4.86 e Growing Sea  0.17 0.70 1.63 0.76 0.55 0.33 0.07 7.44	 10.52 son: 4/15 - 1  0.90 3.71 6.03 5.41 3.00 0.84 18.55	11.90 0/15  1.79 4.58 7.00 6.13 3.39 0.92		

<u>Daily water use rate</u>. The water use of each crop varies based mainly on species requirements, the stage of plant growth and the daily temperature. Hours of sunlight, humidity and wind generally cause a lesser variation of crop water use.

The daily water use amounts shown in Table 3.3 for the normal irrigated crops are approximations of actual water usage and subject to some error. In using this table for irrigation water scheduling it is important that actual field moisture conditions are checked periodically (usually once a week).

Irrigation systems must have capacity to replace the crop water use during the highest use period to prevent yield reduction. This system capacity can be calculated using the maximum daily water use from Table 3.3 in this formula.

$$\frac{\text{in/day X}}{\text{Max. daily}} = \frac{\text{acres X}}{\text{System size}} \times \frac{\frac{1 \text{ day}}{24 \text{ hrs.}}}{\frac{1}{24 \text{ hrs.}}} \times \frac{\frac{450 \text{ gal/min}}{1 \text{ ac. inch}}}{\frac{1}{1 \text{ ac. inch}}} \div \frac{\%}{100} = \frac{\%}{\text{Capacity}} = \frac{\%}{\text{Capacity}}$$
water use

## AVERAGE ALFALFA WATER USE

ALFALFA	f		fourt			irst cu tive we			Use cut	this (	hart f	or the refers	first to we	three ek afte	weeks r cutt	after ing).	
Month		М	ay		June	July	Aug.	Sept.		June			July			Aug.	4
Week	1	2	3	4	<b>All</b>	A11	A11	A11	1	2	3 ,	1	2	3	1	2	3
Date																	
Temperature 50-59	.04	.04	.05	.06	.09	.09	, .08	.07	.06	.07	.09	.06	.07	.09	.05	.06	.08
60-69	.04	.07	.09	.11	.15	.15	.13	.10	.10	.12	.14	.10	.12	.12	.09	.10	.12
70-79	.05	.10	.14	.16	.21	.22	.18	.13	.14	.17	.20	.15	.18	.21	.12	.14	.17
80-89	.06	.12	.17	.19	.25	.26	.22	.17	.17	.20	.24	.17	.21	.25	.15	.18	.21
90-99	.08	.14	.19	.23	.29	.30	.26	.20	.19	.23	.28	.20	.24	.29	.17	.21	.25

### AVERAGE SUNFLOWER WATER USE

Week After Emergence	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Date																
Temperature 50-59	.04	.04	.04	.05	.06	.08	.09	.09	.09	.08	.08	.08	.08	.06	.04	.04
60-69	.04	.05	.06	.08	.11	.13	.15	.15	.15	.13	.13	.13	.13	.08	.05	.04
70-79	.05	.07	.09	.12	.15	.19	.22	.22	. 22	.18	.18	.18	.18	.11	.07	.04
80-89	.06	.08	.11	.14	.18	,22	.26	. 26	.26	. 22	.22	.22	.22	.14	.09	.04
90-99	.07	.09	.12	.16	.21	.26	.30	.30	.30	.26	.26	.26	. 26	.16	.11	.04

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## AVERAGE CORN WATER USE

Week After Emergence	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Date																	
Temperature 50-59	.04	.04	.04	.04	.05	.07	.08	.09	.09	.09	.09	.09	.09	.08	.08	.06	.05
60-69	.04	.04	.05	.07	.09	.11	.13	.15	.15	.15	.14	.14	.14	.13	.13	.09	.07
70-79	.04	.05	.07	.10	.12	.15	.19	.22	.22	.22	.20	.20	.20	.18	.17	.11	.09
80-89	.04	.06	.08	.12	.15	.18	.23	.25	.26	.26	. 24	. 24	.24	.22	.21	.14	.12
90-99	.05	. 07	.10	.13	.17	.21	.26	. 29	.30	.30	.29	.29	.29	.26	25	.17	.14

### AVERAGE WHEAT WATER USE

Week After Emergence	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Date														
Temperature 50-59	.04	.04	.04	.06	.08	.08	.09	.08	.08	.08	.08	.07	.06	.05
60-69	.04	.04	.07	.10	.13	.14	.15	.15	.15	.15	.14	.13	.09	.08
70-79	.04	.06	.10	.14	.18	. 20	.21	.22	.22	.22	.21	.18	.13	.12
80-89	.04	.07	.12	.17	.21	. 24	.25	.26	.26	.26	.24	.22	.16	.14
90-99	.05	.09	.14	.19	. 24	. 27	.29	.30	.30	.30	.28	.25	.19	.17

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TABLE 3.3

## AVERAGE PINTO BEANS WATER USE

Week After Emergence	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Date			1											
Temperature 50-59	.04	.04	.04	.04	.05	.05	.06	.08	.09	.08	.08	.08	.08	.06
-60-69	.04	.04	.05	.06	.07	.09	.11	.14	.15	.13	.08	.08	.12	.08
70-79	.04	.05	.07	.08	.11	.13	.16	.20	.22	.18	.18	.18	.17	.10
80-89	.05	.07	.08	.10	.13	.16	.19	.23	. 26	.22	. 22	.22	.21	.14
90-99	.06	.08	.09	.12	.15	.18	.22	.27	.30	,26	. 26	.26	. 25	.16

### AVERAGE SUGAR BEETS WATER USE

Week After Emergence	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Date																				
Temperature 50-59	.04	.04	.04	.04	.05	.05	.06	.07	.08	.09	.09	.08	,08	.08	.08	.07	.07	.07	.07	.07
60-69	.04	.04	.05	.06	.08	.09	.11	.12	.14	.14	.15	.13	.13	.13	.13	.10	.10	.10	.10	.10
70-79	.04	.05	.07	.08	.11	.13	.15	.18	.20	.21	.22	.18	.18	.18	.18	.13	.13	.13	.13	.13
80-89	.05	.06	.08	.16	.13	.15	.18	.21	.23	.25	.26	.22	.22	. 22	.22	.17	.17	.17	.17	.17
90-99	.05	.07	.09	.12	.15	.17	.20	.24	. 27	.29	.30	.26	.26	.26	.26	.20	.20	.20	.20	.20

### Crop Rooting Depths and Irrigation Depths

For most crops the maximum depth of root penetration is comparable to the height of the plant above ground. While not always true, it is a relatively good guide. The most notable exception to this is alfalfa which is a perennial. Grasses, while perennial, are fairly shallow rooted. Where soil conditions are such that there is no restrictive zone to limit root growth, the maximum rooting depths for certain crops are shown in Table 3.4. Moisture extraction patterns for most crops indicate that if adequate water is available, about 70 percent of the water requirement is taken from the top 50 percent of the root depth. Therefore, in an irrigation management program, it is more practical to use an irrigation depth less than the total rooting depth to compute irrigation amounts to add to the soil profile. Irrigation depths for commonly irrigated crops are listed in Table 3.4.

Table 3.4

Crop	Rooting Depth (feet)	Irrigation Depth (feet)
Alfalfa	3-5	4.0
Sugar Beets	2-4	4.0
Corn	4-6	4.0
Field Beans	2-3	2.5
Small Grain	3-4	3.5
Grass	2-3	2.0
Potatoes	2-3	2.0
Sunflowers	3-5	4.0

## IRRIGATION AND CROP PRODUCTION

When crop stress from moisture shortage is eliminated by proper and timely irrigation, other factors become inhibitors to production. These factors include poor soil structure and tilth, low fertility, poor stands, weeds, insects and diseases. Much of the water applied through irrigation may be wasted unless sound farming practices are followed.

Soil structure and tilth must be favorable in order to have good aeration, good initial water intake, and good soil permeability. Good soil tilth prevents runoff and water waste. Tilth and structure can be maintained or improved by avoiding cultivation of wet fields, addition of manure or plowing under green manure crops, using grass and legumes in rotation, stubble mulch farming, and minimum tillage. On irrigated pastures, cattle should be excluded until surface soil is dry after irrigation.

Low fertility or an imbalance of nutrients are often the limiting factors on irrigated land. The well-fed plant uses water much more efficiently than a plant that is starved or lacking in some nutrient elements. Total water use by a healthy, well-fed plant is greater than for a plant deprived of plant food, but the production per unit of water is much greater for the well-fed plant. Fertility problems should be corrected by the application of barnyard manure and commercial fertilizer. Soil tests, observations, and field experiences help determine the type and amount of fertilizers to use. Crop quality may be more important than crop production. Quality can be greatly improved by proper fertility or timely irrigations.

Adequate moisture and fertility, and good soil physical conditions will not insure high production unless the irrigation farmer controls pests, uses high quality seed of adapted varieties, and uses timely operations. Weeds, insects, and diseases may be a greater problem on irrigated than on dry land. Crops and varieties should be selected to fit the soil and irrigation system. Plant population should be increased in most cases to take advantage of water added by irrigation.

For maximum production and most efficient use of water, plants must have ample moisture throughout the growing season. This is most important during critical periods of growth and development. Although plants indicate moisture stress by various symptoms, yields will usually be reduced by the time the plant shows stress. Time of irrigation should be determined by examination of the soil for moisture content. Symptoms of serious moisture stress, critical water requirement periods and other irrigation considerations are listed on Table 3.5, Page 3-25.

TABLE 3.5

MOISTURE STRESS SYMPTOMS AND
CRITICAL GROWTH PERIOD FOR IRRIGATED CROPS

CROP	SERICUS MOIS- TURE STRESS	CRITICAL GROWTH PERIOD	OTHER CONSIDERATIONS
Alfalfa	Bluish green color, then wilting.	Seedling and immediately after cuttings.	Soil kept moist in upper 4 feet. Avoid over-irrigation. Fall irrigation may be desirable.
Corn	Leaf curl by 10:00 a.m.	Tasseling stage until grain becomes firm.	Sensitive to over-irrigation. Needs adequate moisture from germination to dent stage.
Sugar Beets	Leaves wilt- ing during midday	From seedling stage through root enlarge-ment.	Shallow, frequent irrigation. Avoid over-irrigation, Late fall irrigation lowers amount of sugar.
Small grain	Dull green color, then firing of lower leaves.	Boot, bloom and early head stage.	Irrigate at planting to field capacity. Last irrigation at milk to dough stage. Small grain as a nurse crop, irrigate for needs of grass or alfalfa seedlings.
Potatoes	Darkening of leaves, then wilting.	Tuber swelling period.	Water should not stand around tubers. Do not over-irrigate. Lower tuber quality if plants go into serious moisture stress. Last irrigation 3 to 4 weeks before harvest.
Dry Beans & Soybeans	Dull color, then wilting.	Early bloom, seed forming,	Very sensitive to over-irrigation. Last irrigation at time of first set pod maturity.
Grass Pasture	Dull green color, then wilting.	Seedling stage, for seed pro- duction boot to head formation.	Late fall irrigation is necessary. Frequent, light applications. Irrigate at end of grazing period in a rotation system.

### CONTROL OF SOIL ERCSION

### 1. Water Erosion

- a. The Irrigation Guide recommendations apply irrigation water at rates that will minimize soil losses from the irrigation application. This is achieved by limiting specified irrigation systems to certain soils and slopes and by the designation of irrigation water application rates, stream sizes, length of runs, and time of irrigation.
- b. The conservation treatment of irrigated lands for erosion from rainstorms is listed in the Technical Guide, Section III.

### 2. Wind Erosion

The conservation treatment of irrigated lands for wind erosion is listed in the Technical Guide, Section III.

## CONSERVATION TREATMENT SPECIFICATIONS

### 1. Cropland

Section IV of the Technical Guide contains specifications of the conservation treatment practices. This will include suggested fertilizer applications for irrigated crops.

#### 2. Pastureland

Section IV of the Technical Guide contains the specifications of the conservation treatment practices for pasture and hayland crops. Fertilizer applications and the management of these crops for high production are shown.

#### 3. Water Reduction

Treatment for the control of flooding of irrigated lands and for the reduction of excess ground water conditions is shown in Section IV of the Technical Guide. Practices that will control water problems include but are not limited to:

Dike and Levee
Diversion
Drainage Field Ditch
Drainage Land Grading
Drainage Main and Lateral

Floodway
Floodwater Diversion
Pumping Plant for Water Control
Structure for Water Control
Subsurface Drain